The Milbank Memorial Fund

QUARTERLY

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IN THIS ISSUE

THE article "Effect of Frequency of Family Visiting Upon the Reporting of Minor Illnesses" by Jean Downes and Jane Coulter Mertz indicates some of the factors inherent in studies of morbidity based on observation of families which affect the completeness of reporting of minor illness. The material used was drawn from five different morbidity studies: Hagerstown, the study made by the Committee on the Costs of Medical Care; the Baltimore study, made by Frost and his associates; the study made in the Eastern Health District of Baltimore; and a study of two suburban communities in Westchester County, New York.

The interval between visits to the family was found to be of first importance because of the inability to remember accurately past events which are considered minor. The point of emphasis of the study is also of importance. Concentration on the reporting of one or two types of illness or upon one particular class of illnesses will result in greater precision in their reporting. These points are important in planning future studies of morbidity.

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The longitudinal observation of families for purposes of studying disease and ill health among their members afforded the opportunity to study also the progress of children in their school work in relation to their health status and other social factors. The article "Progress in School of Children in a Sample of Families in the Eastern Health District of Baltimore" by Marguerite Keller presents data for children from 6 to 16 years of age.

The children were divided into two groups: those whose

school progress was satisfactory and those whose progress in school was considered as unsatisfactory. The prevalence of hay fever, asthma, and other chronic illness was much higher among children whose progress in school was rated as unsatisfactory compared with those who were promoted from one grade to another in each year. Also, home conditions such as adequacy of family income and living space were believed to have some influence upon the school status of the child.

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The paper "Social Mobility and Fertility within an Elite Group" by E. Digby Baltzell contributes some suggestive evidence on the effect of social mobility on size of family. The analysis of the fertility of Philadelphia male parents listed in WHO'S WHO in 1940, utilizing such inferred indices of social mobility as Social Register affiliation, private schooling, religion, and birthplace, provides consistent though limited support to the hypothesis that upward social mobility is inversely related to size of family.

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The article by Charles F. Westoff and Clyde V. Kiser entitled "An Empirical Re-Examination and Intercorrelation of Selected Hypothesis Factors" is the twenty-first of a series of reports from the Indianapolis Study on the Social and Psychological Factors Affecting Fertility. This report represents the first systematic attempt to integrate and evaluate the comparative relationships with fertility planning and fertility of a number of variables analyzed previously in separate publications. These factors are: socio-economic status, income, occupation, education, marital happiness, tendency to plan in general, feeling of personal adequacy, feeling of economic security, and fertility-planning status.

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One of the round-table groups organized in connection with the 1952 Annual Conference of the Milbank Memorial Fund

discussed the topic Exploration of Possibilities for New Studies of Factors Affecting Size of Family. Since this was largely a "workshop" session, the transactions will not be published in full. However, a digest of the papers and some of the discussion has been prepared for this issue by Clyde V. Kiser. All of the contributors cited were given the opportunity to edit the digests of their papers or remarks.

EFFECT OF FREQUENCY OF FAMILY VISITING UPON THE REPORTING OF MINOR ILLNESSES

JEAN DOWNES AND JANE COULTER MERTZ[1]

A NUMBER of longitudinal studies of families have been made in order to observe the incidence of illness among their numbers. It is recognized by those who have conducted such studies that the interval between visits to the family has a marked effect upon the accuracy of reporting past illnesses, especially those of a minor nature. Thus, the memory of the informant constitutes an important factor which may influence the level of illness obtained in any morbidity study.

The purpose of this paper is to consider some of the effects of the frequency of family visiting upon the accuracy of reporting minor illnesses. The data are limited to acute respiratory diseases because most illnesses in this class are of a minor nature.

The material used is drawn from five different morbidity studies: Hagerstown, the study made by The Committee on the Costs of Medical Care, the Baltimore Study, made by Frost and his associates, the Eastern Health District of Baltimore Study, and a study of two suburban communities in Westchester County, New York.

DESCRIPTION OF THE FIVE MORBIDITY STUDIES

Hagerstown. The general morbidity study conducted by the United States Public Health Service in Hagerstown, Maryland, included 1,815 families observed during a twenty-eight month period beginning in November, 1921. The families were selected from areas which were representative of the different economic classes in the community. In selecting the families some preference was given to those with children. A preliminary house-to-house survey was made which was followed by a series of sixteen canvasses, each household being visited at intervals of from six to eight weeks (1).

[1] From the Milbank Memorial Fund.

Committee on the Costs of Medical Care. The general morbidity study conducted by the Committee on the Costs of Medical Care included 8,758 families from 130 localities in eighteen states. These families were observed for twelve months during the period February, 1928–June, 1931. They were selected by the state and local health officers without respect to the presence or absence of illness at the time of the initial visit. The surveyed groups tended to be composed chiefly of families with children. After the initial visit these families were visited at intervals of from two to four months. In this study emphasis was placed on obtaining records of all medical care for illness (2).

Baltimore. The study of acute minor respiratory diseases conducted by Van Volkenburgh and Frost included 114 families observed in Baltimore, Maryland during two consecutive years, 1928–1930. The 114 families who volunteered to serve as the special study group were recruited from three sources: (1) the faculty of The Johns Hopkins University; (2) a list supplied by the Instructive Visiting Nurse Association of Baltimore; and (3) the private practice of especially interested physicians. Each family agreed to report by telephone immediately upon the occurrence of any respiratory illness whatever, and to report weekly by postcard even if no case had occurred. Whenever an illness was reported, the family was visited by a staff physician who obtained a record of the illness (3).

Eastern Health District of Baltimore. The general morbidity study was conducted by the United States Public Health Service and the Milbank Memorial Fund during five consecutive years, 1938 to 1943. The sample studied was composed of approximately 1,700 white families living in the Eastern Health District of Baltimore, Maryland. The district was considered as fairly representative of localities in the city in which the wage-earning population lived. Monthly visiting was the method used to gather the illness data (4).

Westchester County, New York. The study of acute respira-

tory illness in two suburban communities in Westchester County, New York was carried on by the Milbank Memorial Fund during three school years, September to June, 1946–1949. The mean number of families visited during the three years of the study was 530 in Pleasantville and 570 in Mt. Kisco. All families in which there were one or more children attending grade school or high school were included in the study. These families were visited every 28 days during the three school years (5).

A summarization of the important characteristics of each of the five studies is presented in Table 1. It is apparent that all these studies were similar with respect to the fact that their populations were composed of families, chiefly those with children. However, there was a wide variation in the interval between visits to the family, or reports from the family, of from one week or less in the Baltimore Study to eight to sixteen weeks in the C.C.M.C. Study. Also, two studies concentrated on only one type of illness.

Incidence of Respiratory Illness

Acute respiratory illness constitutes a relatively high proportion of the total illnesses reported in a general morbidity study. For example, such illnesses formed 40 per cent of the total in the C.C.M.C. Study; 44 per cent in the Eastern Health District Study; and 61 per cent in the Hagerstown Study. Sydenstricker pointed out that the Hagerstown Study included three winter seasons and that during one of them there was an outbreak of influenza. However, he felt that these facts did not seriously distort the data on respiratory disease because of the tendency to underreport such illness (1). An influenza epidemic also occurred during the period of the C.C.M.C. Study. Collins felt that its influence upon the respiratory illness rate was minor since at that particular time only one-fourth of the total families were being observed (2).

Since the acute respiratory diseases are ubiquitous, and there is no evidence of any marked change in their frequency

Table 1. Description of important characteristics of the five morbidity studies.

Characteristics of the Studies	Hagerstown Study 1921–1924	Costs of Medical Care Study 1928–1931	Baltimore Study 1928–1930	Eastern Health District Study 1938–1943	Westchester County Study 1946–1949
Type of Illness Included	All Illness	All Illness	Acute Minor Respiratory Disease	All Illness with Special Interest in Chronic Disease	Acute Respiratory Illness
Frequency of Visits or Reporting	Visits Every 6–8 Weeks	Visits Every 8–16 Weeks	Weekly Reports or More Frequently	Visits Every Month	Visits Every 28 Days
Type of Population	Families With Some Preference to Those With Children	Families—Mainly Those With Children	Families With Children	Families Typical of White Population of Entire E.H.D.	Families With School-Age Children
Method of Recruiting Families	Selected for Convenience for Repeated Visiting	Areas Selected by Health Officers—Families by a House-to-House Canvass	Recruited From Faculty of Johns Hopkins, List of The Visiting Nurse Ass'n and the Practice of Especially Interested Physicians on a Voluntary Basis	All Families in a Random Sample—of City Blocks	All Families in Which There was a School Child
Number of Families	1,815	8,758	114	1,500–1,700 5,108	Mean Number for 3 Years—1,100
Number of Persons	16,517 (person years)	38,544 (person years)	471		4,348
Rate per 1,000 Population (Crude)	664	349	2,779	606	1,414
Rate per 1,000 Population (Adjusted)[1]	681	343	2,582	631	1,415

[1] Adjusted to age distribution of population of all studies combined.

from year to year except during periods when influenza is epidemic, it seems proper to compare the results of these studies where various visiting intervals have been used in the collection of records of illness. It must be emphasized, however, that there may be some variation in the frequency of respiratory illness in various communities and such comparisons as are made do not warrant a strict or precise interpretation.

The first comparison is made between the study conducted by Frost in Baltimore and that made in Westchester County. Table 2 and Appendix Table 1 show the age incidence of acute respiratory illness obtained in these two studies. The two studies are comparable with respect to the following: In both, attention was concentrated upon respiratory illness only, and both studies included only families with children in them. The data for the families in Pleasantville and Mt. Kisco include only those where the occupation of the head of the household was in the professional or managerial class. Thus, these fam-

Table 2. Incidence of acute respiratory illness by age in the professional and managerial class of Pleasantville and Mt. Kisco combined, and in 114 families in Baltimore.

Age Groups	Pleasantville and Mt. Kisco (Professional and Managerial) Sept., 1947–May, 1948	Baltimore Families[2] Nov., 1929–Oct., 1930	Ratio of Baltimore to Pleasantville and Mt. Kisco
	Rate Per 1,000 Persons		
All Ages[1]	1,779	2,779	1.56
0– 4	2,982	3,882	1.30
5– 9	2,649	3,406	1.29
10–14	1,835	2,500	1.36
15–19	1,673	2,042	1.22
20–29	1,250	2,349	1.88
30–39	1,601	2,319	1.45
40–49	1,191	2,039	1.71
50+	839	1,914	2.28

[1] Excludes unknown ages.

[2] The Baltimore rates have been computed on a nine month basis to approximate the Westchester data. From the total of 1,468 cases which occurred from November, 1929 to November, 1930, the 159 cases that occurred in June, July, and August were subtracted. The remaining 1,309 cases were distributed in the same proportions among the age groups as the original 1,468 cases and new rates computed.

ilies are more nearly comparable with those studied by Frost.

The rates in Table 2 have been computed on a nine-month basis, the period from September to May. Data for the Baltimore Study include the period which Van Volkenburgh and Frost considered as a normal or average year with respect to the presence of influenza in the population. Column 3 of the table shows the ratios of the Baltimore rates at each age to the rates in the sample population from Westchester County. For all ages, the incidence of respiratory illness in Baltimore was 56 per cent higher than that noted in the Westchester Study. The comparison of the incidence at specific ages indicates that reporting of illness among adults was much more complete for those in the Baltimore Study than in the Westchester Study. At ages under 20 the Baltimore rates were from 21 to 36 per cent higher than those noted in the Westchester Study. The Westchester County Study was an experiment to learn whether ultra violet lights in the schools might affect the illness rate among school children. The data suggest that the mothers gave greater attention to remembering illnesses of the school children than those among the adult members of the family.

It is apparent from the data presented in Table 2, that weekly reporting of illness by volunteer families, as in the Baltimore Study, was a more effective procedure for obtaining the real incidence of respiratory illness than was reporting every four weeks as was done in the two communities in Westchester County.

The second comparison is made between the study conducted in Westchester County and the study made in the Eastern Health District of Baltimore. Table 3 and Appendix Table 2, show the incidence of acute respiratory illness by age in the two areas. These two studies are comparable with respect to frequency of family visits; in one, visits were made every twenty-eight days, in the other every thirty days. An important difference between the two studies is the fact that in the Westchester County Study attention was centered upon

respiratory illness only, whereas the Eastern Health District investigation included the reporting of all types of illness. The data for the families in Pleasantville and Mt. Kisco include only those where the occupation of the head of the household was in the clerical, skilled or unskilled working class. These families are more nearly comparable to those in the sample from the Eastern Health District which was believed to be representative of the working-class population of Baltimore.

The rates shown in Table 3 have been computed for the nine-month period, September–May. For all ages, the Westchester County rates were 90 per cent higher than those in the Eastern Health District. This excess of incidence was particularly marked among school-aged children. Over twice the amount of acute respiratory illness was reported for them than was reported for the children of similar ages in the Eastern Health District. Again, the special interest in school-aged children in the Westchester County Study appears to have resulted in more complete reporting of their illnesses.

Table 3. Incidence of acute respiratory illness in Pleasantville and Mt. Kisco combined, 1947–1948 (clerical, skilled, semi-skilled and unskilled classes), and in the Eastern Health District of Baltimore, 1940–1941.

Age Groups	Pleasantville and Mt. Kisco[1] Sept., 1947–May, 1948	Eastern Health District of Baltimore Sept., 1940–May, 1941	Ratio of Pleasantville and Mt. Kisco, to Eastern Health District of Baltimore
	Rate Per 1,000 Population		
All Ages[2]	1,152	606	1.90
0– 4	1,775	1,170	1.52
5– 9	2,053	1,016	2.02
10–14	1,206	589	2.05
15–19	1,163	420	2.77
20–24	667	445	1.50
25–34	945	527	1.79
35–44	844	516	1.64
45–54	818	509	1.61
55+	518	569	0.91

[1] Includes only families where the head of the household was in the clerical, skilled, semi-skilled, or unskilled occupational class.
[2] Excludes unknown ages.

Part of the difference in incidence of respiratory illness noted in the two studies is no doubt due to the fact that in one a record of all illnesses was being sought; in the other, only respiratory illnesses were recorded. It is a greater tax on the memory to recall accurately all illnesses which have occurred in the family during the past month than to recall only those of a respiratory nature.

The third comparison is made between the Hagerstown Study and the C.C.M.C. Study. Both of these studies included all morbidity. However, in the C.C.M.C. Study emphasis was placed upon illnesses which had some medical care or for which medicine amounting to fifty cents or over was purchased at a drug store. Also, there was a wide difference between the two studies with respect to the interval between visits. Families in Hagerstown were visited every six to eight weeks, those in the C.C.M.C. Study every eight to sixteen weeks.

The annual incidence of acute respiratory illness by age is shown in Table 4 for Hagerstown and the C.C.M.C. Study. Column 3 of the table shows that for all ages, the Hagerstown families reported 90 per cent more respiratory illness than was

Table 4. Annual incidence of acute respiratory illness in Hagerstown, 1921–1924, and in the Committee on the Costs of Medical Care Study, 1928–1931.

Age Groups	Hagerstown 1921–1924	Committee on Costs of Medical Care 1928–1931	Ratio of Hagerstown to the Costs of Medical Care Study
	Annual Rate Per 1,000 Person Years		
All Ages	664	349	1.90
0– 4	921	537	1.72
5– 9	935	424	2.21
10–14	786	303	2.59
15–19	525	253	2.08
20–24	467	263	1.78
25–34	548	317	1.73
35–44	587	303	1.94
45–54	588	284	2.07
55–64	576	307	1.88
65+	585	303	1.93

reported for those in the C.C.M.C. Study. Part of the differences noted in this table may be due to the effect of an influenza epidemic in Hagerstown during the period of the study. However, the interval between visits is probably the most important factor which affected the accurate reporting of minor illnesses, such as colds and other respiratory ailments.

The comparisons between the results of morbidity studies which have been made suggest that there are two factors which may affect the accuracy of reporting minor illnesses, such as those which fall into the class of respiratory diseases. Of first importance is the interval between visits to the family. The point of emphasis in the study is evidently also important. This is illustrated by the C.C.M.C. Study where the emphasis was on medical care, and is also illustrated by the two studies confined to the investigation of respiratory illness only. The highest rates of respiratory illness were obtained from these latter studies. All of these studies have been of great value and have served a useful purpose. In planning future studies, however, if greater precision in the reporting of minor illness is desired than has been obtained in the past, careful consideration should be given to the factors which may greatly affect the results of any investigation of morbidity.

Failure to Report Illness because of Memory Factor

Collins has pointed out that "survey data on the incidence of illness suffer from the fact that minor cases and even cases serious enough to disable and confine the patient to bed are not all remembered, particularly the ones which occurred some months prior to the visit of the enumerator" (6).

Collins used for illustration data from two surveys made in Western New York State by the United States Public Health Service in which visits were made at intervals of from one to five months. Figure 1, taken from his material, shows for each survey area not the actual incidence rates, but the ratio of the recorded case incidence in each prior month, to the case incidence in the first month prior to the visit. In each area the

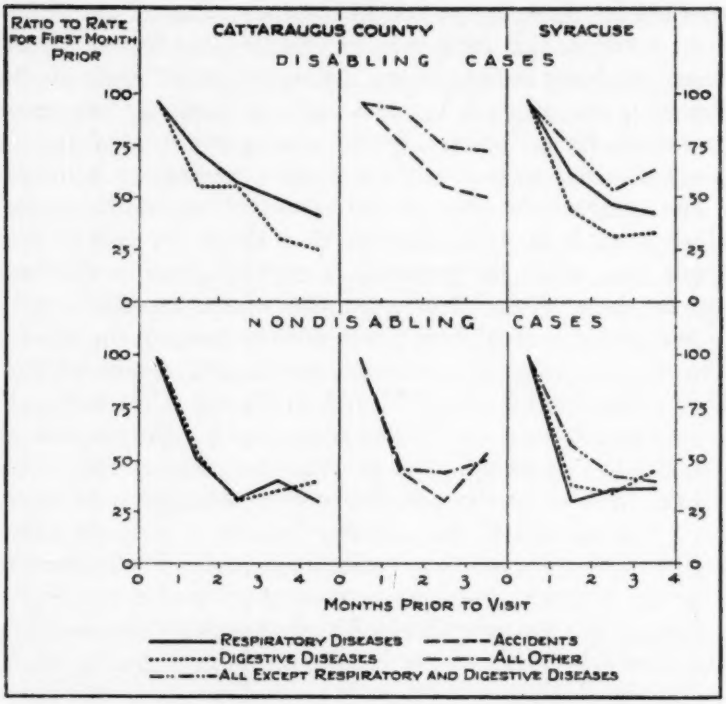

Fig. 1. Ratio (per cent) of recorded case incidence from certain causes in different months prior to the interview, to the case incidence for the first month prior to the interview—house-to-house surveys of illness in two localities in New York State. (Rates corrected for seasonal variation. On this chart zero on the horizontal scale represents the day of the interview and the rate for the first month prior is plotted midway between 0 and 1 month. Similarly, the second month is plotted midway between 1 and 2 months, etc.)

This chart is reproduced with the permission of the publishers of ADMINISTRATIVE MEDICINE, edited by Haven Emerson. Baltimore, The Williams and Wilkins Company, 1951.

reported case incidence fell off rapidly as the time between visits increased. This was particularly true for cases which did not cause disability, but even the disabling cases decreased considerably.

The effect of memory on the reporting of illness can be further illustrated by a study of respiratory illnesses, all of which had their onset within twenty-eight days prior to the visit to the

family, and all of which were completed in the interval between visits to the family. Only completed illnesses were included because it may be assumed that failure to report illnesses present in the family on the day of the visit occurs infrequently and thus has a minor effect upon the level of the rate of illness. In other words, completed illnesses which have occurred in the past are those most apt to be forgotten by the informant.

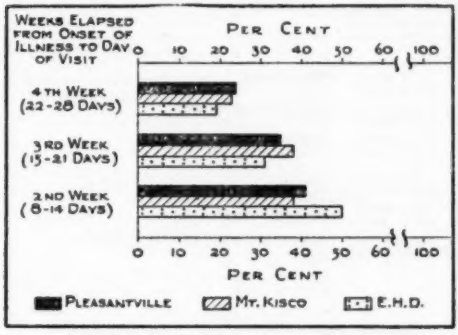
Weeks Elapsed from Onset of Illness to Day of Visit
Per Cent
0 10 20 30 40 50 60 100
4th Week (22-28 Days)
3rd Week (15-21 Days)
2nd Week (8-14 Days)
0 10 20 30 40 50 60 100
Per Cent
Pleasantville
Mt. Kisco
E.H.D.

Fig. 2. Distribution of completed cases of acute respiratory illness by week of onset of the illness prior to the day of the visit. Pleasantville and Mt. Kisco, 1947–1948, and Eastern Health District of Baltimore, 1938–1943.

The data for this analysis are from the studies in Westchester County and in the Eastern Health District of Baltimore. A sample of 100 families was drawn from the population of Pleasantville and 100 from Mt. Kisco for the study year 1947–1948. A sample of 112 families was drawn from the Eastern Health District. Each of the 112 families had one or more school-age children and all were under observation in June, 1938.[2]

Figure 2 and Appendix Table 3 show for Pleasantville, Mt. Kisco, and the Eastern Health District of Baltimore the distribution of completed cases of acute respiratory illness according to the week of onset of the case. Cases where the onset occurred within the first week prior to the visit have been excluded. In each of the three communities there was a decrease in the proportion of reported cases as the interval between the visit and

[2] The method of selection of the samples was as follows: The families in Pleasantville were arrayed by family serial number and every fourth family was included in the sample. The same procedure was followed in selecting the Mt. Kisco group.

The families with a case of chronic disease in them and with school children in them in the Eastern Health District Study were listed by block and a random sample was drawn from the listing. The 112 families constituted 50 per cent of such families under observation in June, 1938.

the onset of the case lengthened. This decrease was most striking in the families studied in the Eastern Health District of Baltimore. Fifty per cent of the cases included had their onset during the second week before the visit and only 19 per cent during the fourth week. Pleasantville and Mt. Kisco had fairly similar proportions of the total reported cases with onset in the different weeks but these communities also showed a marked decrease in the cases which appeared in the fourth week prior to the visit to the family. It is quite apparent that the interval of time between visits to the family for the purpose of collection of records of minor illnesses does affect the accuracy of reporting.

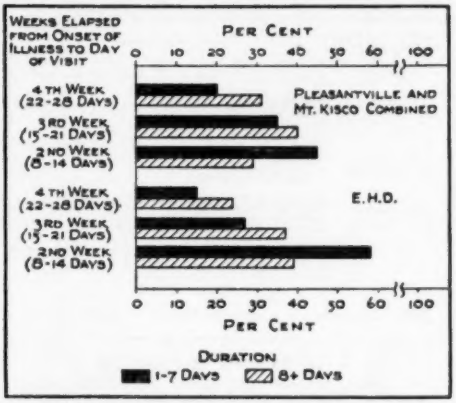
Weeks Elapsed from Onset of Illness to Day of Visit
Per Cent
0 10 20 30 40 50 60 100
4th Week (22-28 Days)
3rd Week (15-21 Days)
2nd Week (8-14 Days)
Pleasantville and Mt. Kisco Combined
4th Week (22-28 Days)
3rd Week (15-21 Days)
2nd Week (8-14 Days)
E.H.D.
0 10 20 30 40 50 60 100
Per Cent
Duration
1-7 Days
8+ Days

Fig. 3. Distribution of completed cases of acute respiratory illness by duration and according to week of onset of the illness prior to the day of the visit. Pleasantville and Mt. Kisco combined, 1947–1948, and Eastern Health District of Baltimore, 1938–1943.

The influence of memory of the informant upon the accuracy of reporting minor illnesses can be shown most strikingly by taking into account the duration of the illness. Figure 3 and Appendix Table 4 show the distribution of completed cases of acute respiratory illness according to the week of onset and the duration of the case. Cases where the onset occurred within the first week prior to the visit have been excluded.

The upper section of Figure 3 shows the distribution of the cases in the Pleasantville families and the Mt. Kisco families combined. The cases with the one to seven-day durations showed a marked decrease from 45 per cent with onsets in the second week prior to the visit to only 20 per cent in the fourth week. The decrease in the reported cases with durations of eight or more days was less marked.

The lower section of Figure 3 shows the same type of data for the families drawn from the Eastern Health District of Baltimore. The cases with durations of one to seven days showed a marked decrease as the interval from the onset to the visit increased. Fifty-eight per cent of these cases had their onsets during the second week prior to the visit and only 15 per cent in the fourth week prior. This decrease in reporting the shorter illnesses is more striking in the Eastern Health District families than among those in Pleasantville and Mt. Kisco.

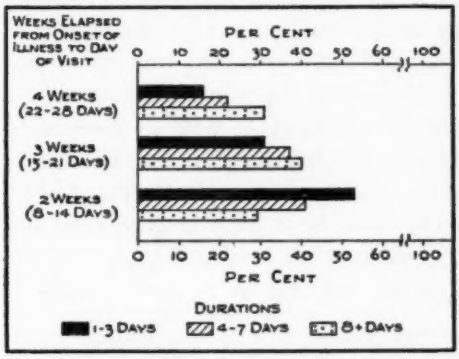
Weeks Elapsed from Onset of Illness to Day of Visit
Per Cent
0 10 20 30 40 50 60 100
4 Weeks (22-28 Days)
3 Weeks (15-21 Days)
2 Weeks (8-14 Days)
0 10 20 30 40 50 60 100
Per Cent
Durations
1-3 Days
4-7 Days
8+ Days

Fig. 4. Distribution of completed cases of acute respiratory illness classified by duration and by the week of onset of the case prior to the day of the visit, Pleasantville and Mt. Kisco, 1947–1948.

The facts brought out in Figure 3 can be further illustrated by consideration of illnesses of relatively short duration, that is, those lasting from one to three days. Figure 4 and Appendix Table 4 show the cases of respiratory illnesses reported in the families in the Westchester County Study according to three categories: those which lasted one to three days; those where the duration was from four to seven days; and those which lasted eight days or longer. The distribution of the cases in each category is according to week of onset prior to the visit to the family.

The distribution of the reported cases with durations of one to three days showed a steady and marked decrease as the time between the visit and the onset of the case lengthened. The cases with a duration of four to seven days showed only a slight decrease from the second to the third week. There was a more striking decrease from the third to the fourth week prior to the visit. It is apparent that the greatest loss of cases due to failure

to remember and report them occurs among those of the shortest duration.

The data from the two communities in Westchester County may be used to estimate the loss of cases of minor respiratory illness in each week prior to the visit to the family. Table 5 shows the incidence of reported cases of acute respiratory illness with onset in each of the four weeks before the visit to the family. The data include incompleted as well as completed illnesses at the time of the visit to the family and are shown for persons under 20 years of age and for adults 20 years and over. It is quite apparent that the rates, both for young persons and adults, are highest for the week of the visit. Thereafter, the decline in incidence is definite and regular in both groups of population.

From the data presented in Table 5 it is possible to estimate the loss of cases of minor respiratory illness due to faulty reporting if the interval between visits is extended over a period of fourteen weeks. Figure 5 shows for each week prior to the visit of the family the per cent of cases which were not reported. Beyond the fourth week previous to the visit the data are based

Table 5. Rate of acute respiratory illness in each of four weeks prior to the visit to the family—Westchester County, 1947–1948.[1]

Classification as to Week of Onset of Illness	Number of Cases of Illness	Rate per 1,000 Population
	462 persons aged 0–19	
Week of Visit	306	662.3
Second Week Prior	225	487.0
Third Week Prior	166	359.3
Fourth Week Prior	113	244.6
	513 persons aged 20+	
Week of Visit	173	337.2
Second Week Prior	129	251.5
Third Week Prior	104	202.7
Fourth Week Prior	64	124.8

[1] Based on a sample of 200 families.

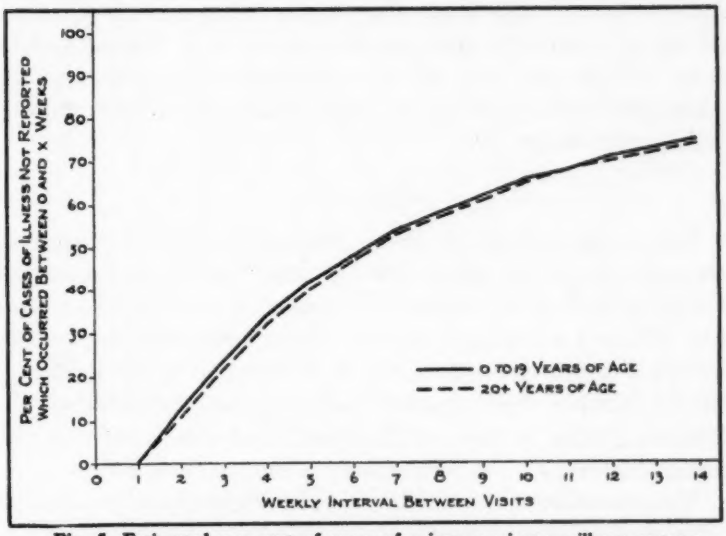

Fig. 5. Estimated per cent of cases of minor respiratory illness not reported which occurred in successive weeks prior to the visit to the family.

upon an extrapolation of the Westchester County experience.[8]

This analysis has served to emphasize some of the factors inherent in studies of morbidity based on observation of families which affect the completeness of reporting of minor illnesses. The interval between visits to the family is of first importance because of the inability to remember accurately past events which are considered minor. The longer the interval between vists the greater is the loss of such cases. The point of emphasis of the study is also of importance. Concentration on one or two types of illness or upon one particular class of illnesses will result in greater precision in their reporting.

The data of the study presented by Van Volkenburgh and Frost demonstrate that weekly reporting and concentration upon a particular class of illnesses in volunteer families will probably yield the highest results. It should be pointed out, however, that study of a population composed of volunteer

[8] The estimate of the proportion of unreported cases in the weeks prior to the visit was derived by application of the method of Least Squares. The formula used is as follows: Log $Y = a + bx$ (9).

families has the limitation of their not being a random sample of the general population of the community. Consequently, such a study may not afford a representative picture of the particular illness experience in the community about which it is desired to learn.

Summary

Some of the effects of the frequency of family visiting upon the accuracy of reporting minor illnesses among their members are described in this paper. The material used is drawn from five different morbidity studies: Hagerstown, the study made by the Committee on the Costs of Medical Care, the Baltimore Study, made by Frost and his associates, the study made in the Eastern Health District of Baltimore, and a study of two suburban communities in Westchester County, New York.

These studies were similar in that the populations studied were composed of families, chiefly those with children. There was a wide variation in the interval between visits to the family, or reports from the family, of from one week or less in the Baltimore Study, to eight to sixteen weeks in the C.C.M.C. Study. Also, two of the studies concentrated on only one type of illness —minor respiratory diseases.

The comparisons between the results of morbidity studies which have been made suggest that there are two factors which may affect the accuracy of reporting minor illnesses, such as those which fall into the class of respiratory diseases. Of first importance is the interval between visits to the family. The point of emphasis in the study is evidently also important. This is illustrated by the C.C.M.C. Study where the emphasis was on medical care, and is also illustrated by the two studies confined to the investigation of respiratory illness only. The highest rates of respiratory illness were obtained from these latter studies.

The effect of memory on the reporting of illness was illustrated by a study of respiratory illnesses, all of which had their onset within twenty-eight days prior to the visit to the family,

and all of which were completed in the interval between visits to the family. The data for this analysis are from the studies in Westchester County and in the Eastern Health District of Baltimore. In each of the three communities there was a decrease in the proportion of reported cases as the interval between the visit and the date of onset of the case lengthened. This decrease was most striking in the families studied in the Eastern Health District of Baltimore. It is quite apparent that the interval of time between visits to the family for the purpose of collection of records of minor illnesses does affect the accuracy of reporting.

This analysis has served to emphasize some of the factors inherent in studies of morbidity based on observation of families which affect the completeness of reporting of minor illnesses. The interval between visits to the family is of first importance because of the inability to remember accurately past events which are considered minor. The longer the interval between visits, the greater is the loss of such cases. The point of emphasis of the study is also of importance. Concentration on one or two types of illness or upon one particular class of illnesses will result in greater precision in their reporting.

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Appendix Table 1. Population and cases of acute respiratory illness. Pleasantville and Mt. Kisco combined and 114 families in Baltimore.

AGE GROUPS	PLEASANTVILLE AND MT. KISCO (Professional and Managerial) Sept., 1947–May, 1948		BALTIMORE Nov., 1929–Oct., 1930	
	Population	Cases	Population	Cases[1]
ALL AGES	1,820	3,237	471	1,309
0– 4	165	492	110	427
5– 9	316	837	64	218
10–14	231	424	50	125
15–19	162	271	24	49
20–29	76	95	43	101
30–39	338	541	94	218
40–49	371	442	51	104
50+	161	135	35	67

[1] From the total of 1,468 cases which occurred from Nov. 1929 to Nov. 1930, the 159 cases that occurred in June, July, and August were subtracted. The remaining 1,309 cases were distributed among the age groups in the same proportions as the original 1,468 cases.

Appendix Table 2. Population and cases of acute respiratory illness. Pleasantville and Mt. Kisco combined and the Eastern Health District of Baltimore.

Age Groups	Pleasantville and Mt. Kisco (Clerical, Skilled, Semi-Skilled and Unskilled) Sept., 1947–May, 1948		Eastern Health District of Baltimore Sept., 1940–May, 1941	
	Population	Cases	Population	Cases
All Ages	2,528	2,911	5,108	3,093
0– 4	218	387	429	502
5– 9	339	696	381	387
10–14	316	381	406	239
15–19	326	379	483	203
20–24	120	80	506	225
25–34	291	275	980	516
35–44	481	406	715	369
45–54	269	220	588	299
55+	168	87	620	353

Appendix Table 3. Distribution of completed[1] cases of acute respiratory illness by the weeks elapsed from the onset of the illness to the day of the visit. Pleasantville and Mt. Kisco 1947–1948 and the Eastern Health District of Baltimore.

Days Elapsed from Onset of Illness to Visit	Pleasantville 1947–1948	Mt. Kisco 1947–1948	Eastern Health District of Baltimore
	PER CENT		
Total	100.0	100.0	100.0
22–28 days	23.7	23.4	19.0
15–21 days	35.4	38.3	31.1
8–14 days	40.9	38.3	49.9
	NUMBER		
Total	362	243	373
22–28 days	86	57	71
15–21 days	128	93	116
8–14 days	148	93	186

[1] Excludes illnesses present on the day of the visit.

Appendix Table 4. Distribution of completed[1] cases of acute respiratory illness by the weeks elapsed from the onset of the illness to the day of the visit according to the duration of the case. Pleasantville and Mt. Kisco combined 1947–1948 and the Eastern Health District of Baltimore.

Days Elapsed from Onset of Illness to Visit	Pleasantville and Mt. Kisco	Eastern Health District of Baltimore	Pleasantville and Mt. Kisco	Eastern Health District of Baltimore
	Per Cent		Number	
	Duration 1–3 days			
Total	100.0	100.0	158	31
22–28 days	16.5	25.8	26	8
15–21 days	31.0	25.8	49	8
8–14 days	52.5	48.4	83	15
	Duration 4–7 days			
Total	100.0	100.0	250	187
22–28 days	22.4	13.4	56	25
15–21 days	37.2	27.3	93	51
8–14 days	40.4	59.3	101	111
	Duration 8+ days			
Total	100.0	100.0	197	155
22–28 days	31.0	24.5	61	38
15–21 days	40.1	36.8	79	57
8–14 days	28.9	38.7	57	60

[1] Excludes illnesses present on the day of the visit.

PROGRESS IN SCHOOL OF CHILDREN IN A SAMPLE OF FAMILIES IN THE EASTERN HEALTH DISTRICT OF BALTIMORE, MARYLAND

MARGUERITE KELLER[1]

THE longitudinal observation of families for purposes of studying disease and ill health among their members afforded the opportunity to study also the progress of children in their school work in relation to their health status and other social factors. This paper presents data for children aged 6–16 in a sample population observed from three to five years in the Eastern Health District of Baltimore.

DATA AND METHOD OF STUDY

During a five-year period, June, 1938 to May, 1943, the Public Health Service and the Milbank Memorial Fund conducted a study of illness in a sample of families in the original Eastern Health District of Baltimore, Maryland. The method of sampling in this particular study has been described in detail in a previous report (1). White families living in thirty-four city blocks formed the sample population. The plan of the study was to follow families that lived in a group of houses in certain blocks rather than to follow a selected group of families. No attempt was made to continue visiting families which moved out of these houses during the period of the study, but the new families that moved into the houses vacated in the sample blocks were included in the study. The record of illness started with the first visit to the family and each family was visited once a month thereafter.

In addition to inquiry concerning illness, the family informant was asked about the progress in school of each school-age child in the family. On each visit information was sought as to whether the child was in school or had stopped school. If the child stopped school during the school term the reason for dropping out of school was obtained. At the end of each school

[1] From the Milbank Memorial Fund.

term a record was made as to whether the child passed from one grade to another, failed or was transferred to a school for special instruction.

The children aged 6–16 in the sample of families studied in the original Eastern Health District attended eight different public schools and three parochial schools. One of the public schools was for subnormal children and the curriculum included only occupational instruction. In addition, four of the public schools included what was termed as "opportunity classes." These classes were for children with some mental retardation. One public school was for high school students only, that is, it included grades nine to twelve.

The record for each school child was obtained from the family informant. It included the name or number of the school and the grade in which the child was enrolled.

The population presented in this analysis includes all children aged 6–16 who were observed two years or longer.

Table 1. Male and female children aged 6–16, classified according to their school status during observation. Eastern Health District of Baltimore, 1938–1943.

School Status of Child	Both Sexes	Male	Female
	PER CENT		
Total	100.0	100.0	100.0
Satisfactory	72.4	70.7	74.3
Unsatisfactory			
Failed in School	21.8	24.5	18.7
Stopped School	3.1	2.6	3.6
Opportunity Class[1]	2.7	2.2	3.4
	NUMBER		
Total	1,209	648	561
Satisfactory	875	458	417
Unsatisfactory			
Failed in School	264	159	105
Stopped School	37	17	20
Opportunity Class[1]	33	14	19

[1] Special class for children who are considered retarded in their school work.

Certain Characteristics of the School Children

A record of school status, that is, the standing of the child with respect to progress or failure in school, was obtained for five years in the study in the Eastern Health District of Baltimore. It is of interest to compare certain characteristics of the children who were promoted regularly with children who had an "unsatisfactory" school rating.

The children between the ages of 6 and 16 who were observed two or more years were divided into two groups: (1) those with a rating of "satisfactory" school progress, and (2) those with a rating of "unsatisfactory" school progress.

The satisfactory school progress group consisted of children who had passed from one school grade to a higher grade each year of observation or who had been promoted each year until the time they reached the school-leaving age, or who were promoted while attending vocational school.

The unsatisfactory school progress group included: (1) those who failed in one or more years, (2) those who stopped school or were not in school because of illness or mental deficiency,[2] and (3) those who were transferred to an opportunity class.

A total of 1,209 children aged 6–16 were studied. Of these, 875 were classed as having a satisfactory school status. The remaining 334 were in the group classed as having an unsatisfactory school status. Table 1 shows the distribution of the male and female children classified according to their school status during observation. A slightly higher per cent of the females than of the males were in the group which had a satisfactory school rating, 74 per cent compared to 71 per cent. On the other hand, 25 per cent of the males failed in school compared with 19 per cent of the females. The difference between these latter per cents is statistically significant.[3] A rela-

[2] Disabled and institutionalized children were included in this group.

[3] The standard error of the difference between per cents was the test used. (2) The formula is:

$$\sigma d = \sqrt{PQ\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}$$

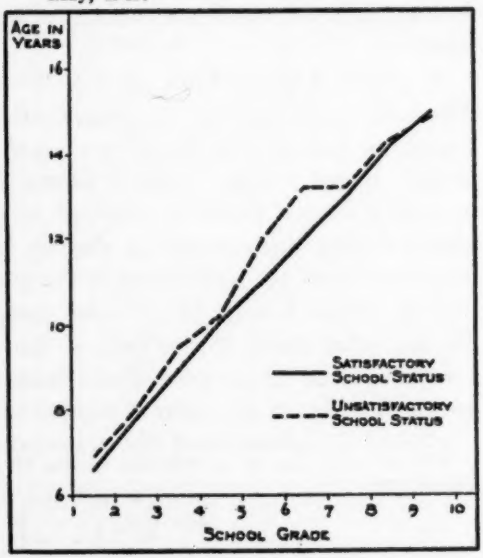
School Grade First Year of Observation	First Quartile	Median	Third Quartile	First Quartile	Median	Third Quartile
	Satisfactory School Status			Unsatisfactory School Status		
First	6.01	6.56	7.16	6.20	6.86	7.49
Second	7.27	7.84	8.40	7.59	8.25	8.98
Third	8.30	8.92	9.46	8.63	9.50	10.38
Fourth	9.64	10.14	10.91	8.16	10.20	11.94
Fifth	10.33	11.02	12.03	10.19	12.00	13.13
Sixth	11.42	12.02	12.67	11.75	13.21	13.39
Seventh	12.20	12.96	13.83	12.75	13.22	14.00
Eighth	13.63	14.18	14.87	13.70	14.30	14.90
Ninth	14.27	15.03	15.75	14.00	14.90	15.50

Table 2. Median age of children with a satisfactory or unsatisfactory school status, classified according to their school grade as of the first year of observation. Eastern Health District of Baltimore, June, 1938–May, 1943.

tively small proportion of children in each sex group stopped school or were transferred to an opportunity class.

Age. The median age in years of children classified according to grade as of the first years of observation and according to school status during observation is presented in Table 2 and Figure 1. In each grade the children who were given an unsatisfactory school rating tend to be somewhat older than those who were promoted regularly. A relatively small number of children studied attended

Fig. 1. Median age in years of children of a satisfactory and an unsatisfactory school status according to their school grade as of their first year of observation. Eastern Health District of Baltimore, June, 1938–May, 1943.



Relationship to the Head of Household	School Status of Child	
	Satisfactory	Unsatisfactory
	Per Cent	
Total	100.0	100.0
Child	88.8	87.7
Stepchild	2.6	4.8
Adopted Child	0.4	0.0
Grandchild	5.0	5.4
Other Relationship	3.2	2.1

Table 3. Distribution of children aged 6–16, classified according to relationship to the head of the household and to school status of child, Eastern Health District of Baltimore, June, 1938–May, 1943.

high school; consequently the median ages for grades 10 to 12 are not shown.

Relationship to Head of Household. Table 3 shows the distribution of school children whose school progress was satisfactory and those whose progress was unsatisfactory, classified according to their relationship to the head of the household. Approximately the same proportion in the two groups were children of the head of the household; 89 per cent in the group of children who had a satisfactory school rating and 88 per cent in the unsatisfactory group. The proportion of stepchildren in the group of children classed as having an unsatisfactory school status was higher than that found in the satisfactory school status group for both sexes, 4.8 per cent compared to 2.6 per cent. This difference was not found to be significant at the 5 per cent level of confidence.

Asthma and Hay Fever. Table 4 shows the prevalence of asthma and hay fever among male and female children according to their school status during observation. Among male and female children in the unsatisfactory school status group the prevalence of persons with asthma and hay fever was higher than in the group of children who had a satisfactory school rating with the exception of asthma among the females. When the sexes are combined, the prevalence of both asthma and hay fever was found to be considerably higher among the

Classification	School Status of Child		
	All Children	Satisfactory	Unsatisfactory
	Rate Per 1,000 Population		
	BOTH SEXES		
Asthma	19.9	17.1	26.9
Hay Fever	7.4	5.7	12.0
	MALE		
Asthma	30.9	26.2	42.1
Hay Fever	9.2	8.7	10.5
	FEMALE		
Asthma	7.1	7.2	6.9
Hay Fever	5.3	2.4	13.9

Table 4. Prevalence of asthma and hay fever among male and female children aged 6–16, according to their school status during observation. Eastern Health District of Baltimore, June, 1938–May, 1943.

children classified as having an unsatisfactory school progress rating. The difference in these rates was found at the 5 per cent level to be statistically significant.[4]

Other Chronic Conditions. The prevalence of chronic illness among children according to their school status during observation is shown in Table 5. There was a consistently higher rate of each type of chronic illness among the children in the unsatisfactory school status group than among those in the group of children who were promoted regularly. The differences all proved to be statistically significant. The difference in the prevalence of rheumatic fever[5] among the children for the two groups was especially high: 62.9 cases per 1,000 population in the unsatisfactory school status group and 20.6 cases per 1,000 population in the group of children who had a satisfactory school rating.

[4] The standard error of the difference between rates was the test used. (2) The formula is:

$$\sigma d = \sqrt{PQ\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

[5] Persons who had a history of rheumatic fever at some time but no illness from it during observation were excluded.

Type of Chronic Condition	School Status of Child		
	All Children	Satisfactory	Unsatisfactory
	Rate Per 1,000 Population		
Rheumatic Fever	32.3	20.6	62.9
Behavior Problem	9.1	8.0	12.0
Mental Deficiency	14.1		50.9
Mental Retardation	3.3	1.1	9.0
Heart Disease	4.1	3.4	6.0
Other Chronic Disease	10.8	2.3	32.9

Table 5. Prevalence of chronic illness among children aged 6–16, according to their school status during observation. Eastern Health District of Baltimore, June, 1938–May, 1943.

From the data presented it is apparent that there was a striking relationship between prevalence of hay fever, asthma, and other chronic illness among the children aged 6–16 and the standing of these children with respect to progress or failure

Table 6. Annual incidence of respiratory and of total illness among children aged 6–16, classified according to school status and by age group.[1] Eastern Health District of Baltimore, June, 1938–May, 1943.

Classification	School Status of Child		Ratio Unsatisfactory
	Satisfactory	Unsatisfactory	
	Rate Per 1,000 Person Years		Satisfactory
	ALL AGES		
All Illness	1,169.4	1,583.2	1.35
Respiratory Illness	584.7	627.4	1.07
	AGE 6–9		
All Illness	1,625.7	1,848.6	1.14
Respiratory Illness	804.8	720.3	.90
	AGE 10–13		
All Illness	1,067.5	1,538.9	1.44
Respiratory Illness	535.2	612.0	1.14
	AGE 14–16		
All Illness	838.5	1,046.6	1.25
Respiratory Illness	425.5	439.3	1.03

[1] Children permanently disabled are excluded.

in school. It may be inferred that the presence of a chronic illness may cause frequent absence from school, even a prolonged absence from school or transferral to an opportunity class. Thus, such conditions may be important factors contributing to failure in school.

Acute Illness. Table 6 presents the annual incidence of respiratory and of total illness among children aged 6–16, classified according to age group and school status. The children who were permanently disabled were excluded from the population. From these data it may be seen that the rates of total illness were generally higher among the children classed as having an unsatisfactory school status than among those in the satisfactory school status group for each age classification. When the ages are combined, the rate of total illness among the children having an unsatisfactory school status was 35 per cent higher than the rate among children having a satisfactory school status. The incidence of respiratory illness was quite similar for the two school status groups. Respiratory illness is not selective; it is found in families regardless of the school status of the children.

It has been shown that the prevalence of asthma, hay fever, and chronic illness as well as the annual incidence of total illness may have some influence on the school status of the child. Minor illness such as respiratory illness does not show this relationship.

Socio-Economic Characteristics of the Families

The 1,209 school-age children included in this analysis came from 684 families. It is of interest to learn whether there were important differences among the families whose children had a satisfactory school status when compared to those whose children had an unsatisfactory school rating. Socio-economic characteristics of the two groups of families were considered. Thus an analysis was made of mobility, amount of family income, home ownership, and amount of living space or degree of crowding, size of family, the education and occupation of the head of the household.

Moving Status of Family	School Status of Children					
	Total	Satisfactory	Unsatisfactory	Total	Satisfactory	Unsatisfactory
	Per Cent			Number of Families		
Total	100.0	100.0	100.0	684	437	247
Stable	61.8	62.7	60.3	423	274	149
Mobile	38.2	37.3	39.7	261	163	98

Table 7. Families classified according to moving status of family and school status of one or more children in the family. Eastern Health District of Baltimore, June, 1938–May, 1943.

Mobility. The two groups of families were first considered as to mobility. It can be seen from Table 7 that there was little difference between the two groups in the proportion of families which moved. Slightly over a third of each group moved at some time during the study.

Income. The mean annual income for each group of families is presented in Table 8. The mean annual income, $1,699, of the families with children who were promoted regularly was significantly higher than the mean income $1,547, of the families whose children had an unsatisfactory school status.[6] The

Table 8. Mean family income according to school status of one or more children in the family. Eastern Health District of Baltimore, June, 1938–May, 1943.[1, 2]

School Status of Children	Mean Annual Income	Standard Error of Mean	Standard Deviation	Number of Families
Satisfactory	$1,699	± 42.49	802	356
Unsatisfactory	$1,547	± 54.61	751	189

[1] For the satisfactory school status group, 18 families which have received relief, 1 family which had an income over $5,000, and 62 families having unknown income were excluded.

[2] For the unsatisfactory school status group, 26 families which have received relief, 2 families which had incomes over $5,000, and 30 families having unknown income were excluded.

[6]

	Mean	Difference	Standard Error of Difference
Satisfactory School Status	$1,699		
Unsatisfactory School Status	$1,547	$152	$69.19 t = 2.19

(Continued on page 400)

Ownership of Home	School Status of Children					
	Total	Satisfactory	Unsatisfactory	Total	Satisfactory	Unsatisfactory
	Per Cent			Number		
Total	100.0	100.0	100.0	684	437	247
Families Owned Homes	53.4	58.6	44.1	365	256	109
Families Rented Homes	46.6	41.4	55.9	319	181	138

Table 9. Distribution of families according to home ownership and school status of one or more children in the family. Eastern Health District of Baltimore, June, 1938–May, 1943.

distribution of the families by income group is shown in Appendix Table 2. It is interesting to note that 12 per cent of the families whose children had an unsatisfactory school status received public assistance while less than 5 per cent of the satisfactory school progress group had some public assistance.

Home Ownership. Table 9 presents the distribution of the two groups of families according to home ownership. Again there was a definite difference between the families whose children had a satisfactory school status and those whose children were not promoted regularly in school. Fifty-nine per cent of the families whose children had a satisfactory school status owned their home compared with 44 per cent of the families whose children had an unsatisfactory school status. It would be expected that the group with the higher mean annual income would also have a larger proportion of home owners.

Crowding. Each family was given a crowding rating; that is, each was graded as to the number of rooms in relation to the number, age, and sex constitution of the family or household members. There were four categories: (1) more than adequate, (2) adequate, (3) unsatisfactory, and (4) very un-

The standard error of the difference between means was the test used and the value for "t" was obtained by computing the ratio of the difference between means to the standard error of the difference between means. (3)

$$\sigma d = \sqrt{\frac{\sigma^2}{M_1} + \frac{\sigma^2}{M_2}}$$

satisfactory. The description of these categories is as follows:

1. More than adequate: More than one room for sleeping per person or per married couple plus two additional rooms (for living room and kitchen).
2. Adequate: One room for sleeping per person or for each two persons of eligible age and sex plus two additional rooms (for living room and kitchen).
3. Unsatisfactory: One room for sleeping for each two persons of eligible age and sex, plus one additional room for kitchen.
4. Very unsatisfactory: Less than one room for sleeping for each two persons of eligible age and sex, plus additional room for kitchen.

In Appendix 3 there is a further description of what is meant by eligible age and sex groups for room sharing. The crowding rating is an attempt to arrive at a more sensitive index than is afforded by ratings based on number of persons per room.

It is evident from Table 10 and Figure 2 that the families or households whose children were classed as having a satisfactory school status had higher proportions of "adequate" and "more than adequate" living space than did the families whose children had an unsatisfactory school status. For example, 32 per cent and 36 per cent of the families whose chil-

Table 10. Distribution of families according to crowding rating and school status of one or more children in the family. Eastern Health District of Baltimore, June, 1938–May, 1943.

Crowding Rating of Family	School Status of Children					
	Total	Satisfactory	Unsatisfactory	Total	Satisfactory	Unsatisfactory
	Per Cent			Number		
Total	100.0	100.0	100.0	684	437	247
More Than Adequate	29.7	32.3	25.1	203	141	62
Adequate	34.2	35.9	31.2	234	157	77
Unsatisfactory	21.2	20.6	22.3	145	90	55
Very Unsatisfactory	14.9	11.2	21.4	102	49	53

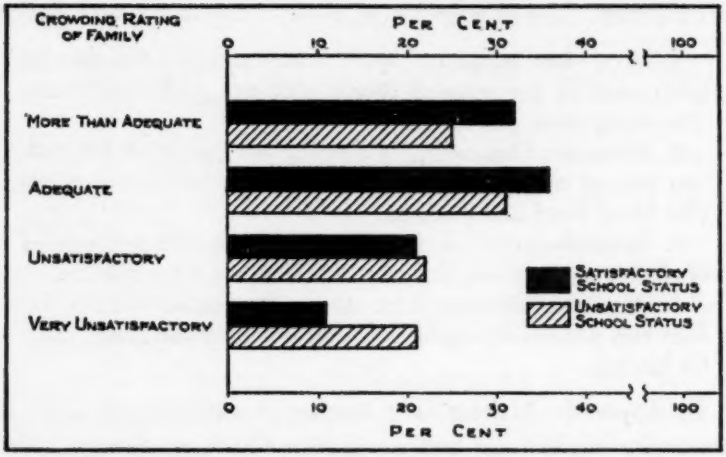


Fig. 2. Distribution of families by their crowding rating. Eastern Health District of Baltimore, June, 1938–May, 1943.

dren were promoted regularly in school were considered "more than adequate" and "adequate," respectively, while only 25 per cent and 31 per cent of the families with children classed as having an unsatisfactory school progress were so rated. Combining the families in the "adequate" and "more than adequate" living space classifications, the difference between the two groups is found to be statistically significant.

From the above analysis, it would certainly seem that amount of income, home ownership, and adequacy of living space may have had some influence upon the school status of the children.

Size of Family. Table 11 shows the median size of the families at the time of first observation arrayed according to the age of the head of the household. The families whose children had an unsatisfactory school rating were larger for nearly all age groups of household heads. In both of the two school status groups the size of family tends to increase as the age of the head of the household increases.

Education of Household Head. The differences in educational attainment of family heads of household were not great

Age Group of Head of the Household	First Quartile	Median	Third Quartile	First Quartile	Median	Third Quartile
	School Status of the Children in the Family					
	Satisfactory			Unsatisfactory		
All Ages	3.67	4.54	5.60	3.93	5.05	6.70
20–24	2.92	3.33	3.88	3.50	4.00	4.50
25–29	3.38	4.25	5.33	3.13	4.00	6.00
30–34	3.26	3.98	4.76	3.68	4.29	5.29
35–39	3.68	4.62	5.25	4.00	5.61	6.94
40–44	3.88	4.74	5.92	3.86	5.07	6.50
45–49	3.97	4.97	6.57	4.00	5.50	5.35
50–54	3.69	4.29	5.45	4.82	5.80	7.88
55–59	4.06	5.43	6.31	5.63	6.25	7.00
60–64	4.00	5.70	6.75	3.75	5.00	6.25
65+	3.63	4.50	6.00	3.75	4.50	6.25

Table 11. Median size of families classified according to school status of one or more children in the family and according to the age group of the head of the household. Eastern Health District of Baltimore, June, 1938–May, 1943.

when the two school status groups are compared (Table 12). The families whose children had an unsatisfactory school rating had a slightly higher proportion of heads of the household who

Table 12. Distribution of families according to education completed by the head of the household and school status of one or more children in the family. Eastern Health District of Baltimore, June, 1938–May, 1943.

Education Completed by Head of Household	School Status of Children					
	Total	Satisfactory	Unsatisfactory	Total	Satisfactory	Unsatisfactory
	Per Cent			Number		
Total	100.0	100.0	100.0	684	437	247
Fourth Grade or Less[1]	16.8	14.9	20.0	105	60	45
Fifth–Eight Grades	63.3	63.0	64.0	397	253	144
High School[2]	17.7	18.9	15.6	111	76	35
College or Professional	2.2	3.2	0.4	14	13	1
Education Unknown				57	35	22

[1] Including special school for handicapped.
[2] Including vocational school and business school.

Employment Status of Head of Household	School Status of Children					
	Total	Satisfactory	Unsatisfactory	Total	Satisfactory	Unsatisfactory
	Per Cent			Number		
Total	100.0	100.0	100.0	684	437	247
Employed	85.5	87.0	83.0	585	380	205
Seeking Work	4.2	3.0	6.5	29	13	16
Retired or Home	0.6	0.7	0.4	4	3	1
Disabled	3.1	3.4	2.4	21	15	6
Housewife	6.3	5.9	6.9	43	26	17
Institution	0.3	—	0.8	2	—	2

Table 13. Distribution of families according to employment status of the head of the household and school status of one or more children in the family. Eastern Health District of Baltimore, June, 1938–May, 1943.

had not completed the fourth grade than did those with children receiving a satisfactory school status, 20.0 per cent compared with 14.9 per cent. On the other hand, the group of families whose children had passed regularly in school had a slightly higher proportion of heads with college and professional training, 3.2 per cent compared with 0.4 per cent. The two middle classifications of school attainment showed great similarity between the two groups.

Employment Status and Occupation of Head of Household. The distribution of the heads of the household according to employment status is presented in Table 13. Again there was little difference noted between the two groups. In the group of families whose children were promoted regularly, 87 per cent of the heads of the household were employed while 83 per cent were employed in the group of families whose children had an unsatisfactory school status. The percentage of heads of the household seeking work was somewhat higher for the group of families whose children had an unsatisfactory school status. When the employed heads of the household were classified according to occupational class, Table 14, the two distributions were quite similar.

From these data it can be seen that school status of children in this study may be associated with the following socio-eco-

Occupation of Head of Household	School Status of Children					
	Total	Satisfactory	Unsatisfactory	Total	Satisfactory	Unsatisfactory
	Per Cent			Number		
Total	100.0	100.0	100.0	585	380	205
Managers and Proprietors	13.7	13.7	13.7	80	52	28
Clerical and Salesmen	9.0	8.9	9.3	53	34	19
Skilled Workers	28.9	29.5	27.8	169	112	57
Semiskilled Workers	29.6	28.4	31.7	173	108	65
Unskilled Workers	8.4	8.7	7.8	49	33	16
Protective and Service Workers	10.4	10.8	9.7	61	41	20

Table 14. Distribution of all employed heads of households according to their occupational class and school status of one or more children in the family. Eastern Health District of Baltimore, June, 1938–May, 1943.

nomic characteristics of the family: income, home ownership, crowding, and size of family. There was apparently no relationship between the children's school status and family stability or to the education or employment status of the head of the household.

Summary

A study of certain characteristics of school children and of socio-economic characteristics of their families has been presented from data reported in the sample population studied in the Eastern Health District of Baltimore during the period June, 1938 to May, 1943. The children between the ages of 6 and 16 who were observed two or more years were divided into two groups: (1) those with a rating of satisfactory school progress, and (2) those with a rating of unsatisfactory school progress.

Eight hundred and seventy-five children from 437 families composed the satisfactory school progress group, while 334 children from 247 families were in the unsatisfactory school progress group.

A slightly higher per cent of the females than of the males were in the group which had a satisfactory school rating. On the other hand, a significantly higher per cent of the males failed in school than did the females.

In each grade the children who were given an unsatisfactory school rating tended to be somewhat older than those who were promoted regularly.

The distribution of children classified according to their relationship to the head of the household was quite similar for the children whose school progress was satisfactory and for those who had an unsatisfactory school status.

The prevalence of asthma and hay fever for both sexes was considerably higher among the children classified as having an unsatisfactory school progress rating than among the children in the satisfactory school status group, 38.9 per 1,000 population compared to 22.8 per 1,000 population.

There was a consistently higher rate of each type of chronic illness among the children in the unsatisfactory school status group than among those who were promoted regularly. The difference in the prevalence of rheumatic fever among the children for the two groups was especially high.

The incidence of respiratory illness was quite similar for the two school status groups.

The socio-economic characteristics of the families whose children had a satisfactory school status were compared to those whose children had an unsatisfactory school rating.

There was little difference between the two groups in the proportion of families which moved during the study.

The mean annual income, $1,699, of the families with children who were promoted regularly was significantly higher than the mean income, $1,547, of the families whose children had an unsatisfactory school status.

A higher per cent of the families whose children had a satisfactory school status owned their homes compared with families whose children had an unsatisfactory school status, 59 per cent and 44 per cent, respectively.

The families were rated as to the degree of crowding in their homes; that is, each was graded as to the number of rooms in relation to the number, age, and sex constitution of the family. The families whose children were classed as having a satisfactory school status had higher proportions of "adequate" and "more than adequate" living space than did the families whose children had an unsatisfactory school status.

The families whose children had an unsatisfactory school status were larger for nearly all groups classified by the age of household heads, than of the families whose children were promoted regularly. There were only slight differences in educational attainment of family heads of the household when the two school status groups were compared. The distribution of the heads of household according to employment status showed little difference between the two school status groups.

It is apparent that there were striking differences in the prevalence of hay fever, asthma, and other chronic illness among the children aged 6–16, classified by their standing with respect to progress or failure in school. It was also concluded that amount of income of the head of the household, home ownership, and adequacy of living space may have had some influence upon the school status of the children.

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Appendix Table 1. Distribution of children aged 6–16 classified according to their school grade as of first year of observation and school status during observation.[1] Eastern Health District of Baltimore, June, 1938–May, 1943.

School Grade First Year Observed	School Status of Child		
	All School Children	Satisfactory	Unsatisfactory
	Number		
Total	1,026	760	266
First	127	82	45
Second	102	65	37
Third	106	78	28
Fourth	102	77	25
Fifth	109	83	26
Sixth	97	74	23
Seventh	101	67	34
Eighth	85	73	12
Ninth	60	48	12
Tenth	42	38	4
Eleventh	20	18	2
Twelfth	3	3	0
Opportunity Class	19	4	15
Vocational School	46	45	1
Other and Unknown	7	5	2

[1] Excludes 183 children who became 6 years of age during their observation.

Income Class as of the First Year Observed	School Status of Children			
	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory
	Per Cent		Number	
Total	100.0	100.0	437	247
Relief	4.8	12.0	18	26
$499 or Less	2.9	1.8	11	4
500– 999	12.5	17.5	47	38
1,000–1,499	27.4	23.0	103	50
1,500–1,999	24.3	24.0	91	52
2,000–2,499	16.0	12.0	60	26
2,500–2,999	5.9	6.5	22	14
3,000–3,999	5.1	1.8	19	4
4,000–4,999	0.8	0.5	3	1
5,000 and Over	0.3	0.9	1	2
Unknown Income			62	30

Appendix Table 2. Annual income of families classified according to school status of one or more children in the family. Eastern Health District of Baltimore, June, 1938–May, 1943.

Appendix 3

Instructions (crowding rating) given for determining suitable age and sex for sharing a sleeping room were as follows:

1. Sex: One sleeping room for two persons of opposite sex is considered suitable if the two persons are married or if both are under 6 years of age.

2. Age: (a) A separate sleeping room is to be allowed for infants under 2 years of age, except where there is more than one infant under 2.

(b) Two persons under 20 years of age who are of the same sex may share the same sleeping room if there is less than six years difference in their ages.

(c) Two adults who are 20 years of age or older and of the same sex may share the same sleeping room if there is less than fifteen years difference in their ages.

(d) An adult who is 20 to 25 years of age may share a room with a younger person of the same sex if there is less than six years difference in their ages.

3. Lodgers: A separate room is to be allowed for each lodger of different sex, unless a married couple. Related lodgers will be treated in the same way as family members, except that no allowance will be made for a separate living room and kitchen for lodgers.

SOCIAL MOBILITY AND FERTILITY WITHIN AN ELITE GROUP

E. DIGBY BALTZELL[1]

THE existence of an inverse relationship between social class and fertility in the more industrialized nations of Western civilization has been regarded as a confirmed sociological fact for some decades (1). Within the social structure as a whole, parents with more education, higher incomes, and various other indices of "high" socio-economic status tend to have smaller families than parents in less fortunate circumstances. In the nineteen-thirties, however, the findings of empirical research, both in this country and in Europe, indicated that this inverse relationship was reversed at the higher socio-economic levels (2). The topmost socio-economic groups, for example, were shown to have similar and/or higher fertility rates than those immediately below them. With each successive study reaffirming these relationships, the question of "why" has become more pertinent. The evidence of the Indianapolis Study, for example, has raised many questions concerning the reasons why social-class position persistently colors all other associations between various social and psychological variables and fertility.

In interpreting this relationship between fertility and socio-economic position, differential social mobility and its various social and psychological consequences may be an important intervening variable. Westoff, for example, has emphasized the hypothesis that the *process* of achieving a given class-position may exert equal if not greater influence on family size than the sociological consequences of the position itself (3). In other words, fertility declines as one ascends the social-class hierarchy mainly because the requirements of a more expensive pattern of consumption militate against having children and partly because of the internationalization of small-family norms already existing in the cultural defi-

[1] From the Department of Sociology, University of Pennsylvania.

nitions of the class of destination. Consequently, fertility should be expected to decline at successively higher levels in the social-class hierarchy partly because those persons in higher positions are, on the average, more mobile than those below them. On the other hand, as the top of the hierarchy is approached, this inverse differential may be reversed precisely because, in contrast to those immediately below them, social mobility may be less characteristic of persons at the top levels. The following analysis of the fertility patterns of a small group of persons of high socio-economic status in Philadelphia should be conceived of as an exploratory attempt to test the existence of an inverse relationship between upward social mobility and family size.

In 1940, 770 residents of Philadelphia were listed in WHO'S WHO IN AMERICA.[2] On the basis of selected criteria of social mobility, this comparatively homogeneous Philadelphia elite will be divided into various sub-groups in order to test the hypothesis that the less mobile parents have the largest families. There are, of course, both advantages and limitations in using these WHO'S WHO biographies to test this relationship. In the first place, the fact that persons listed in WHO'S WHO are, from the standpoint of society as a whole, a relatively homogeneous socio-economic group is a decided advantage. On the other hand, the inferential nature of the various indices of social mobility used below is, of necessity, a limiting factor. The fertility data, in addition, suffer from omissions which are characteristic of WHO'S WHO biographies (*see* below). As a result of these and other considerations, the present analysis is intended more to suggest the potential value of the fertility/mobility hypothesis than presuming to confirm or reject it.

In most societies, there are people at the top of the class pyramid who, coming from "old family" backgrounds and

[2] WHO'S WHO IN AMERICA, Volume 21, 1940–1941. Chicago, The A. N. Marquis Company, 1940. This paper is part of a more complete analysis of the biographies of the 770 Philadelphians listed in WHO'S WHO in 1940. *See* Baltzell, E. Digby: The Elite and the Upper Class in Metropolitan America: A Study of Stratification in Philadelphia. (Unpublished doctoral dissertation, Columbia University, 1952.)

often possessing inherited wealth, may be considered of high *ascribed* social-class position. In Philadelphia, the SOCIAL REGISTER is a convenient listing of families whose members, on the whole, possess these attributes of high ascribed position.[3] On the other hand, there are the so-called "self-made men" who presumably have *achieved* their high occupational status largely through their own efforts and sacrifices. (4) In order to test the fertility/mobility hypothesis, the 770 Philadelphians who were listed in WHO'S WHO in 1940 may be divided into two groups—the 226 persons who were also listed in the SOCIAL REGISTER in that year and the 544 persons who were not so listed.[4] While both of these groups within the Philadelphia elite were composed of persons with high occupational, educational, and income positions in the City, the 226 listed also in the SOCIAL REGISTER were more likely, on the whole, to have been of high ascribed position (less mobile), whereas the high positions of the remaining 544 were more likely to have been achieved (more mobile). For example, it is reasonable to infer that a private, secondary school education, Protestant religious affiliation, and the ties of place and tradition are, among other things, useful indices of high ascribed social class position in America; the evidence in Table 1 indicates that persons also listed in the SOCIAL REGISTER are more likely to possess these attributes than the remaining persons listed only in WHO'S WHO.[5]

The 770 Philadelphians listed in WHO'S WHO in 1940 were

[3] The SOCIAL REGISTER, first published in New York City in 1888, is currently published, in November of each year, by the Social Register Association for the following large cities in America: New York, Philadelphia, Chicago, Baltimore, Boston, St. Louis, Cleveland, Pittsburgh, Buffalo, Cincinnati-Dayton, San Francisco, and Washington, D. C. *See* my dissertation for a more thorough analysis of the SOCIAL REGISTER as an index of high ascribed social class position in America.

[4] As there is no demographic or biographical information available for persons listed in the SOCIAL REGISTER but not in WHO'S WHO, this paper must, of necessity, be limited to an analysis of the 770 Philadelphians in WHO'S WHO.

[5] Chi squares were computed to test the statistical significance of the relationships between these attributes of social mobility and SOCIAL REGISTER affiliation (Table 1). The tests revealed that all the relationships, except "Protestant Religion", were significant. The values for P were .001 for "Private Secondary Schooling", "Born on Eastern Seaboard", and "Born in Philadelphia"; .01 for "Born in the United States"; and .10 for "Protestant Religion".

Inferred Indices of High Ascribed Status	Social Register Affiliation	Non Social Register Affiliation
	Per Cent	Per Cent
Private Secondary Schooling*	41	15
Protestant Religion	64**	58**
Born in the United States	97	91
Born on the Eastern Seaboard***	87	64
Born in Philadelphia	52	29
Total Number	226	544

Table 1. Philadelphians listed in Who's Who in 1940: Schooling, religious affiliation, and birthplace by Social Register affiliation.

* Private Schooling does not include the Catholic Parochial School.

** As these figures include those not reporting on religion, it is pertinent to note that, of the 513 persons reporting on religious affiliation, 99 per cent of the Social Register group, in contrast to 86 per cent of those listed only in Who's Who, were Protestant.

*** Eastern Seaboard includes the Middle Atlantic, New England, and South Atlantic Census areas.

older men and women. Of those reporting age (719 or 94 per cent), all were over thirty-six years of age in 1940, a large majority (83 per cent) were over fifty, and their mean age in 1940 was 61.6 years. Those persons listed in the Social Register were somewhat older (mean age in 1940: Social Register group, 64.3; non Social Register group, 60.5). Thus, assuming that wives tend, on the whole, to be only slightly younger than their husbands, most families in this study have passed through the child-bearing period. As females constituted only a small proportion (7 per cent) of the Philadelphians listed in Who's Who in 1940, they will be discussed separately below.[6]

What are the marital and family characteristics of the two groups of males within this listing of distinguished Philadelphians? In the first place, while 92 per cent of the total report ever having been married, those also listed in the Social Register are more likely to report marriage (95 per cent ever mar-

[6] It is of interest to note that Kiser and Schacter found that "women comprise only about 6 per cent of all persons listed in the last edition (1948–1949) of Who's Who." Clyde V. Kiser and Nathalie L. Schacter, Demographic Characteristic Of Women in Who's Who, Reprinted from The Milbank Memorial Fund *Quarterly*, xxvii, No. 4. October 1949, p. 395.

Number of Children	Social Register Affiliation	Non Social Register Affiliation
	Per Cent	Per Cent
1 Child	14	21
2 Children	30	36
3 Children	31	21
4 or more Children	25	22
Number of Male Parents	149	352
Children Per 100 Male Parents	280	262

Table 2. Philadelphians listed in Who's Who in 1940: Family size of male parents by Social Register affiliation.

ried) than the remainder (90 per cent ever married). This differential in the proportion married is the first clue to the more familistic nature of the former, less mobile group.

As the under-reporting of children in Who's Who biographies makes any estimate of the number of childless marriages in this sample extremely hazardous, the fertility patterns of *parents*, rather than married couples, will be analyzed below. From other sources, there is some evidence that, if anything, there are fewer childless couples within the Social Register group. For example, it was found that at least six "Social Registerite" fathers in this study (all with more than three children) failed to report the names of their children in Who's Who.

The fertility rates of 501 male parents are presented in Table 2. The parents also listed in the Social Register tend to have larger families, and are less likely to have only children and more likely to have large families (three or more children), than the remaining parents listed only in Who's Who.[7] Here, then, are two groups of male parents of high socio-economic status in Philadelphia; those parents who have been apparently less mobile than the rest are more likely to report large families.

[7] A comparison of the distributions in Table 2 by Chi Square analysis indicates a statistically significant degree of association between family size and Social Register affiliation ($P = .02–.05$).

Secondary Schooling of Male Parents	Social Register Affiliation		Non Social Register Affiliation	
	Number of Male Parents	Children Per 100 Male Parents	Number of Male Parents	Children Per 100 Male Parents
Private Schooling*	66	300	51	300
No Private Schooling	83	264	301	255
Total	149	280	352	262

Table 3. Philadelphians listed in Who's Who in 1940: Fertility of male parents by Social Register affiliation and secondary schooling.

* Private Schooling does not include the Catholic Parochial School.

As an additional test of the fertility/mobility hypothesis, education, religious affiliation, and birthplace of parent—presumed indices of ascribed status and mobility—will now be viewed in relation to differences in family size.

In the first place, perhaps a private secondary school education, which depends almost entirely on the socio-economic position of one's parents, may be an even more valid index of high ascribed social-class position than Social Register affiliation. If this is true, privately educated parents, regardless of Social Register affiliation, should be expected to have more children than those parents without the advantages of this start in life and all that it implies in the way of wealth and social contacts.[8] The inverse relationship between fertility and social mobility is suggested once again in Table 3 which indicates that privately educated parents tend to have the largest families. Moreover, family size remains the same within the group of privately educated parents, regardless of Social Register affiliation.

In America, Protestants, on the whole, tend to have higher

[8] There is, of course, no way of ascertaining the differences in inherited wealth between these various sub-groups in Who's Who. There is reason to believe, however, that inherited wealth, perhaps more than wealth *per se*, is an important variable in fertility differentials within the higher socio-economic stratum. This factor may be especially important where professional education demands sacrifices during the child-bearing period.

Religious Affiliation of Male Parents	Social Register Affiliation		Non Social Register Affiliation	
	Number of Male Parents	Children Per 100 Male Parents	Number of Male Parents	Children Per 100 Male Parents
Episcopalian	70	304	53	263
Other Protestant	36	258	177	261
Catholic-Jewish	1*	—	30	293
No Religion Reported	42	256	92	246
Total	149	280	352	262

Table 4. Philadelphians listed in Who's Who in 1940: Fertility of male parents by Social Register and religious affiliation.

* One Catholic with two children.

social origins than non-Protestants. As shown in Table 4, for example, there is only one non-Protestant parent in the Social Register group. Within this Philadelphia elite, Episcopalians have the highest ascribed social class positions.[9] Consequently, it is pertinent to note that (*see* Table 4) the Episcopalian parents tend to have larger families than the other Protestant parents.[10] Furthermore, the Episcopalian parents who are also listed in the Social Register, presumably the least mobile parents, have larger families than even the non-Protestants. In other words, using religious affiliation as an index of differential mobility, Table 4 indicates that, at least within the Protestant group, fertility is inversely related to social mobility.

Upward social mobility often coincides with horizontal mobility. Especially in the small town, one rarely "crosses the tracks" within the same community where everyone knows

[9] Episcopalian religious affiliation as an index of high ascribed social class position in Philadelphia is thoroughly documented elsewhere. *See* my unpublished dissertation. Research in this area has found that Episcopalians tend to have a high socio-economic rating. *See,* for example, Pope, Liston: Religion and the Class Structure. The *Annals* of the American Academy of Political and Social Science, Vol. 256, March, 1948, pp. 84–91; and Freedman, Ronald and Whelpton, P. K.: Social and Psychological Factors Affecting Fertility. x. Fertility Planning and Fertility Rates by Religious Interest and Denomination. The Milbank Memorial Fund *Quarterly,* July 1950, xxviii, No. 3, p. 319 (Reprint p. 442.)

[10] The relatively high fertility of the "Other Protestant" parents who are not listed in the Social Register (Table 4) is partially explained by the presence of three Swedeborgian parents who report eight, ten, and twelve children respectively.

Birthplace of Male Parents	Social Register Affiliation		Non Social Register Affiliation	
	Number of Male Parents	Children Per 100 Male Parents	Number of Male Parents	Children Per 100 Male Parents
Philadelphia	73	290	97	272
All other Areas	76	270	255	257
Total	149	280	352	262

Table 5. Philadelphians listed in Who's Who in 1940: Fertility of male parents by Social Register affiliation and birthplace.

"who" one is. On the contrary, one must move out, and usually to the large city, in order to escape previous social definitions. In Philadelphia in 1940, almost two-thirds (64 per cent) of the persons listed in Who's Who were born outside the metropolitan area. Thus persons who have achieved success in the City are presumably more mobile than the residents of Philadelphia as a whole. It has been shown that members of the Social Register group are less horizontally mobile than the remaining persons listed only in Who's Who (Table 1). In Table 5, there is apparently a consistent inverse relationship between horizontal mobility, which may imply upward mobility, and family size.

To some extent, of course, Social Register affiliation is achievable. In order to ascertain the hard core of "Old Family" Philadelphians, the 226 persons who were listed in both Who's Who and the Social Register in 1940 were traced back to the turn of the century. It was found that, of the 149 male parents listed in the Social Register in 1940, only forty-five were listed, or had parents who were listed, in the Philadelphia Social Register as of 1900. These forty-five parents, the hard core of "Old Family" Philadelphians and as such neither horizontally or vertically mobile, should be expected to have larger families than any other group in Who's Who. That these "Proper Philadelphia" parents, many of them descendents of Philadelphia's Colonial aristocracy, reported an average of over

Indices of Social Mobility	Number of Male Parents	Children Per 100 Male Parents
(1) Male Parents Listed in Who's Who But Not in the Social Register	352	262
(2) Male Parents Listed in Who's Who And Also in the Social Register	149	280
(3) Philadelphia Born Male Parents Listed in Who's Who and Social Register	73	290
(4) Privately Educated Male Parents Listed in Who's Who and Social Register	66	300
(5) Episcopalian Male Parents Listed in Who's Who and Social Register	70	304
(6) "Old Family" Male Parents: Listed in Philadelphia Social Register in 1900	45	313
All Male Parents in Who's Who	501	267

Table 6. Philadelphians listed in Who's Who in 1940: Fertility of male parents by inferred indices of social mobility.

three children, and that no less than 40 per cent of them reported four or more children, tends to substantiate further the fertility/mobility hypothesis.

In Philadelphia in 1940, there were 770 persons listed in Who's Who in America. In terms of several logically inferred indices of upward social mobility, the 501 males who reported the names of their children were divided into various subgroups. A consistent inverse relationship between upward mobility and family size was found to obtain within this Philadelphia elite (Table 6). In a sense, the tabulations in Table 6 may be conceived of as a summary of a series of logically manipulated, "ex post facto" experiments.[11]

Do the fertility patterns of the small number (54) of women listed in Who's Who tend to support the fertility/mobility hypothesis? In the first place, one hardly would expect the "emancipated" or career-oriented women listed in Who's

[11] Approximating the experimental model, we have attempted to test an hypothesis in a set of contrasting situations; the variable of "social mobility" was injected, as it were, into a succession of partially controlled situations. *See* Greenwood, Ernest: Experimental Sociology, a study in method. New York, King's Crown Press, 1945, Chapter iv.

WHO to be familistically inclined. These women in the Philadelphia elite, for example, are much less likely to have ever been married than the men; while over 90 per cent of the men report ever having been married, only 44 per cent of the women so report. The women also listed in the SOCIAL REGISTER, however, are more likely to report marriage (64 per cent ever married) than the remaining women (37 per cent ever married). Moreover, the mothers listed in the SOCIAL REGISTER report considerably more children than the rest (266 as against 162 children per 100 mothers). Although this elite contains only a small number of women, the less mobile group, like the men, appear to be more familistic.

Social mobility and the attendant decline in traditional, family values characterize the modern world where there are few fixed landmarks and where most men are "constantly spurred on by a desire to rise and a fear of falling." This paper has attempted to indicate how, within a group of distinguished Philadelphians, fertility tends to be inversely related to upward social mobility. While the evidence is limited quantitatively, the consistent differences in fertility, as between the various sub-groups within this relatively homogeneous elite, provide some insight into the nature of differential fertility. Any conclusions drawn from so limited a source must, of course, remain highly tentative.

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SOCIAL AND PSYCHOLOGICAL FACTORS AFFECTING FERTILITY

XXI. AN EMPIRICAL RE-EXAMINATION AND INTERCORRELATION OF SELECTED HYPOTHESIS FACTORS[1]

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THE Indianapolis Study of Social and Psychological Factors Affecting Fertility has resulted thus far in the publication of twenty analytical reports, most of which have concentrated on specific hypotheses. Owing partly to the division of labor in the Study[2] and partly to time lags separating the publications, only a limited amount of synthesis and organization of the empirical results has been done. Although a final integrated report is planned after all the hypotheses have been analyzed, a brief evaluation should be useful at this time. This article is not intended to be a comprehensive summary of the Indianapolis Study to date; it consists rather in an attempt to interrelate some of the existing main findings of the Study in so far as they relate to our knowledge about contraceptive practice and size of planned families.

Also prompting this analysis is an interest in securing precise and uniform comparisons of the bearing of socio-economic status (SES) on the observed relationships between several hypothesis variables and fertility planning and the fertility of planned families.[3] The reports on specific hypotheses have rather consistently indicated that SES accounts, at least in part, for many of the relationships observed. The question of the comparative persistency of this influence will be examined

[1] This is the twenty-first of a series of reports on a study conducted by the Committee on Social and Psychological Factors Affecting Fertility, sponsored by the Milbank Memorial Fund with grants from the Carnegie Corporation of New York. The Committee consists of Lowell J. Reed, Chairman; Daniel Katz; E. Lowell Kelly; Clyde V. Kiser; Frank Lorimer; Frank W. Notestein; Frederick Osborn; S. A. Switzer; Warren S. Thompson; and P. K. Whelpton.

[2] Ten people other than the members of the original Committee have participated in the Study.

[3] This problem is discussed more fully and documented in Westoff, Charles F.: The Changing Focus of Differential Fertility Research: The Social Mobility Hypothesis. The Milbank Memorial Fund *Quarterly*, January, 1953, XXXI, No. 1, pp. 26–28.

here. For one hypothesis variable under consideration, namely marital adjustment, there has been no previous analysis of the influence of SES.[4] This particular question will be also partially answered. The final objective of this report is to indicate the extent to which our ability to predict variation in the dependent variables in question is improved by a joint consideration of several selected factors.

Measurement and Data

The hypothesis factors in addition to SES that have been selected for re-analysis are marital adjustment (more precisely, marital happiness), feeling of personal adequacy, tendency to plan in general, and feeling of economic security.[5] These particular factors were selected primarily because of their fairly pronounced individual relationships with fertility-planning status or size of planned family, or both. Although it is recognized that the measurement of these socio-economic and psychological variables might possibly be improved within the framework of the existing data by the newer techniques of scaling, as some recent experimentation has suggested,[6] this was not attempted in this present work. Instead, the summary indices originally constructed and used by the various authors

[4] This lack of information is emphasized by the author. *See* Reed, Robert B.: Social and Psychological Factors Affecting Fertility. VII. The Interrelationship of Marital Adjustment, Fertility Control, and Size of Family. The Milbank Memorial Fund *Quarterly*, October, 1947, XXV, No. 4, p. 425 (Reprint p. 301).

[5] For the original articles, *see Ibid.*, pp. 383–425; Westoff, Charles F. and Kiser, Clyde V.: Social and Psychological Factors Affecting Fertility. XVII. The Interrelation of Fertility, Fertility Planning, and Feeling of Personal Inadequacy. The Milbank Memorial Fund *Quarterly*, July, 1952, XXX, No. 3, pp. 239–297 (Reprint pp. 741–799); Freedman, Ronald and Whelpton, P. K.: Social and Psychological Factors Affecting Fertility. XII. The Relationship of General Planning to Fertility Planning and Fertility Rates. The Milbank Memorial Fund *Quarterly*, April, 1951, XXIX, No. 2, pp. 218–243 (Reprint pp. 549–574); and Kiser, Clyde V. and Whelpton, P. K.: Social and Psychological Factors Affecting Fertility. XI. The Interrelation of Fertility, Fertility Planning, and Feeling of Economic Security. The Milbank Memorial Fund *Quarterly*, January, 1951, XXIX, No. 1, pp. 41–122 (Reprint pp. 467–548). The original analysis of socio-economic status appeared in Kiser, Clyde V. and Whelpton, P. K.: Social and Psychological Factors Affecting Fertility. IX. Fertility Planning and Fertility Rates by Socio-Economic Status. The Milbank Memorial Fund *Quarterly*, April, 1949, XXVII, No. 2, pp. 188–244 (Reprint pp. 359–415).

[6] Edgar F. Borgatta of the Laboratory of Social Relations, Harvard University, has done a considerable amount of experimentation on the Indianapolis data with the use of modern scaling techniques. This work is not yet complete.

have been retained. The main advantage of this is, of course, comparability with the previous articles. Thus for wives and husbands separately the summary indices of personal adequacy, general planning, and economic security will be used.[7] The summary index of SES is a composite for the couple; information on marital happiness of the wife and husband was derived from the answers to a single multiple-choice question.[8]

The measure of fertility employed here is the number of live births. The extent and success of the couples' planning of these births is measured through the classification by "fertility-planning status" used throughout the Indianapolis study. Based upon detailed pregnancy and contraceptive histories, this classification essentially orders the couples according to the extent to which they had succeeded in preventing unwanted pregnancies.[9] Only those couples classified as "relatively fecund" are included here.[10]

[7] For the details of the construction of these indices *see* Westoff and Kiser, *op. cit.*, pp. 286–297 (Reprint pp. 788–799); Freedman and Whelpton, *op. cit.*, pp. 221–224 (Reprint pp. 552–555); and, Kiser and Whelpton, XI. The Interrelation of Fertility, Fertility Planning, and Feeling of Economic Security. *Op. cit.*, pp. 112–114 (Reprint pp. 538–540).

[8] The summary index of SES appears in Kiser and Whelpton, IX. Fertility Planning and Fertility Rates by Socio-Economic Status. *Op. cit.*, pp. 213, 215, and 244 (Reprint pp. 385, 387, and 415).

The question on marital happiness is: "Everything considered how happy has your marriage been?" Seven multiple-choice responses were provided, ranging from "Extremely Happy" to "Extremely Unhappy." Although Reed utilized two additional criteria of marital adjustment, the desire to improve spouse and amount of disagreement between wife and husband, the responses to the single question on marital happiness were found to be more sensitive to the fertility variables and thus only these data are used here. The statistical analysis with the other two indices of marital adjustment was in fact done but the results will not be incorporated here.

[9] *See* Whelpton, P. K. and Kiser, Clyde V.: Social and Psychological Factors Affecting Fertility. VI. The Planning of Fertility. The Milbank Memorial Fund *Quarterly*, January, 1947, XXV, No. 1, pp. 63–111 (Reprint pp. 209–257); Whelpton, P. K. and Kiser, Clyde V.: Social and Psychological Factors Affecting Fertility. VIII. The Comparative Influence on Fertility of Contraception and Impairments of Fecundity. The Milbank Memorial Fund *Quarterly*, April, 1948, XXVI, No. 2. pp. 182–236 (Reprint pp. 303–357); and Westoff, Charles F.; Herrera, Lee F.; and Whelpton, P. K.: Social and Psychological Factors Affecting Fertility. XX. The Use, Effectiveness, and Acceptability of Methods of Fertility Control. The Milbank Memorial Fund *Quarterly*, July, 1953, XXXI, No. 3, pp. 291–357 (Reprint pp. 885–951).

[10] The "relatively fecund" group includes all couples reporting four or more

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Previous reports[11] have described at length the study design and the type of couples studied. Briefly, the intensive interview Study was restricted to couples meeting the following eligibility requirements: husband and wife native white, both Protestant, married during 1927–1929, neither previously married, husband under 40 and wife under 30 at marriage, both completed at least the eighth grade, and residents of a large city most of the time since marriage.

The choice of statistical techniques for an analysis of this nature is complicated by at least three problems. First, the indices of the psychological factors are based upon data which fall far short of the ideal requirements for quantification. At best, these data can be roughly classified as qualitatively ordered series of responses. A translation of qualitative responses into quantitative categories presents many complications not the least of which is the implicit assumption of equality of intervals. A second problem inheres in the reliance on correlational statistics employed in the major part of this analysis which necessitate certain assumptions resting on only weak foundations with these data, for example, those of normality and linearity. The third problem accrues from the use of the inflated sample and its implications for tests of statistical significance. The process of inflation by the duplication of punch cards would seem to negate the necessary requirement of statistical independence of units. This problem has been partly resolved in this analysis by a reduction in the chi square values obtained by a constant proportion which represents the

live births. It also includes couples with three or fewer live births unless they knew or had good reason for believing that conception was physiologically impossible during a period of at least 24 or 36 consecutive months since marriage (24 if never pregnant, 36 if ever pregnant). Failure to conceive when contraception was not practiced "always" or "usually" during periods of the above durations was considered good reason for such belief.

[11] *See* Whelpton, P. K. and Kiser, Clyde V.: Social and Psychological Factors Affecting Fertility. IV. Developing the Schedules and Choosing the Type of Couples and the Area to be Studied. The Milbank Memorial Fund *Quarterly*, October, 1945, XXIII, No. 4, pp. 386–409 (Reprint pp. 139–162). Also *see* Whelpton, P. K. and Kiser, Clyde V.: Social and Psychological Factors Affecting Fertility, V. The Sampling Plan, Selection, and Representativeness of Couples in the Inflated Sample. The Milbank Memorial Fund *Quarterly*, January, 1946, XXIV, No. 1, pp. 49–93 (Reprint pp. 163–207).

ratio of real cases to the total inflated sample. The probability values obtained from the chi squares in this work, consequently, are fairly rigorous. Needless to say, these problems do not exhaust the list.

This article will be divided into two sections: the first relates to fertility planning, and its correlates; and the second to size of the planned family and factors related to it.

Fertility Planning

A logical starting point for this entire analysis is to examine the intercorrelations of all the factors being considered. These coefficients[12] are presented in Table 1. It may be noted first of all that all relationships are positive.[13] As expected, the highest intercorrelations are those between the index of SES and the components of this index. More important, however, is the fact that the correlations between SES and the psychological factors tend to be higher than the intercorrelations of the psychological factors themselves. This holds true for both wives and husbands for every psychological factor except personal adequacy.

The total correlations of each of the factors with fertility-planning status are shown in the last column (wives) and bottom row (husbands). The values of these coefficients are very low with the highest value being .35 with SES. However, two points of interest may be noted. The index of SES, based upon eight variables, is more closely related to fertility planning status than is any one of the three separate components of SES considered here. Although the correlations between fertility planning status and the psychological factors are low, there also remains the important question of their comparative independence. In other words, are the relationships observed between the various psychological indices and fertility planning mainly the result of their mutual joint connection with SES?

[12] Coefficients of correlation were computed by use of the conventional Pearson formula.

[13] The signs throughout this analysis indicate the true direction of the relationships. The machine codes were adjusted for this purpose.

Factors	Index Socio-Economic Status	Husband's Average Annual Income	Husband's Longest Occupation	Education	Marital Happiness
Index Socio-Economic Status	x	*	*	.61	.29
Husband's Average Annual Income	.80	x	*	.44	.25
Husband's Longest Occupation	.69	.53	x	.42	.21
Education	.72	.51	.55	x	.22
Marital Happiness	.27	.26	.18	.18	x
Index General Planning	.34	.29	.26	.18	.21
Index Personal Adequacy	.27	.28	.20	.22	.35
Index Economic Security	.38	.39	.31	.26	.20
Fertility-Planning Status	.35	.26	.23	.23	.23

Table 1. Coefficients of correlation[1] showing the interrelationships among nine selected factors. The data for wives are shown in the upper right section of the table and those for husbands in the lower left section.

* Data relate only to husbands.

[1] All signs are plus. The number of cases for each correlational analysis is 1,444 except those involving the husband's longest occupation which are based on 1,402 cases. A coefficient of approximately .03 is required for a statistically significant departure from zero at the 5 per cent level and .05 for the 1 per cent level according to R. A. Fisher's t formula. The corresponding requirements for the deflated sample (N = 860) are .07 and .09.

Or, conversely, how much of the SES association with fertility planning can be explained by the psychological factors?

In order to provide some answers to these questions, coefficients of partial correlation are presented in Table 2. The dominating influence of SES is rather clearly in evidence. The partial correlations of SES with fertility-planning status with the several psychological factors individually held constant are only slightly lower than the original value of r (.35). When feeling of economic security is held constant in the partial analysis, the zero order r remains unchanged for the wives and is decreased only to .33 for husbands. The inversion of this comparison results in perhaps an even more pronounced manifestation of the overriding influence of SES. The zero order r between economic security and fertility-planning status is .09 for wives and .13 for husbands. With SES controlled, the first order r changes sign for wives (–.07) and is reduced to .00 for husbands.

The same associations are shown by a completely different mode of analysis in Table 3. This table reflects the results of subdividing the couples into various numbers of categories of

Index General Planning	Index Personal Adequacy	Index Economic Security	Fertility-Planning Status
.41	.24	.43	.35
.34	.25	.45	.26
.28	.15	.33	.23
.27	.17	.24	.24
.28	.36	.22	.24
x	.33	.23	.20
.22	x	.27	.17
.19	.32	x	.09
.19	.20	.13	x

marital happiness, personal adequacy, etc., and testing the statistical significance of the resulting distributions in which fertility-planning status is cross-tabulated with another factor. For example, the cell in the row of SES and column on marital happiness in the upper deck of the table means that out of eight subclasses of marital happiness (four each for wives and husbands) six distributions of fertility-planning status by SES are significant at the 1 per cent level of probability. Conversely (cell in second row of column on SES) out of the ten subclasses of SES only two distributions of fertility-planning status by marital happiness are significant at this level. When fertility-planning status is varied with SES within economic security classes eight out of eight distributions are significant as compared with zero out of ten when SES classes are held constant and economic security is varied with fertility planning.

Table 2. Total and partial correlations of five selected factors with fertility-planning status.

Factors Correlated with Fertility-Planning Status	Total Correlations	Controls for Partial Correlations				
		Socio-Economic Status	Marital Happiness	General Planning	Personal Adequacy	Economic Security
	WIVES					
Socio-Economic Status	.35	x	.30	.30	.32	.35
Marital Happiness	.24	.15	x	.20	.19	.23
General Planning	.20	.07	.14	x	.15	.19
Personal Adequacy	.17	.09	.09	.11	x	.15
Economic Security	.09	−.07	.04	.05	.05	x
	HUSBANDS					
Socio-Economic Status	.35	x	.31	.31	.31	.33
Marital Happiness	.23	.15	x	.20	.17	.21
General Planning	.19	.08	.15	x	.15	.17
Personal Adequacy	.20	.12	.13	.17	x	.17
Economic Security	.13	.00	.09	.10	.07	x

We can conclude from Tables 2 and 3 that SES is by far the most dominant factor of those studied in association with fertility planning status. Further partial correlations of the second and third order were computed between SES and fertility planning with various combinations of the psychological factors held constant but the general picture remained unchanged. Marital happiness exhibits a somewhat higher association with fertility planning with SES constant than does either general planning or personal adequacy. As far as the data in this form indicate, the psychological factors, especially feeling of economic security, are of negligible importance in relation to fertility planning. Further corroboration of this is evidenced in Table 4 where various multiple correlation combinations are presented. The effect of adding the three psychological factors

Table 3. The number of distributions[1] out of the designated totals that are significant at the 1 per cent and 5 per cent levels. Each distribution is a cross classification between fertility-planning status and a given factor with another factor controlled. (The numbers in the bottom line indicate the total number of distributions utilized for each particular interrelation in the column above.)

Factors Cross-Classified with Fertility-Planning Status	Factors Controlled				
	Socio-Economic Status	Marital Happiness	General Planning	Personal Adequacy	Economic Security
	One per cent level of significance				
Socio-Economic Status	x	6	5	7	8
Marital Happiness	2	x	3	3	3
General Planning	1	2	x	1	1
Personal Adequacy	0	1	2	x	1
Economic Security	0	1	0	0	x
	Five per cent level of significance				
Socio-Economic Status	x	6	5	7	8
Marital Happiness	4	x	3	6	3
General Planning	1	3	x	3	4
Personal Adequacy	1	2	3	x	2
Economic Security	2	1	0	1	x
	Total number of distributions utilized				
	10	8	6	8	8

[1] The number of degrees of freedom in these distributions varies from one to twelve.

Factor Combinations Correlated with Fertility-Planning Status	Wives	Husbands
General Planning and Personal Adequacy	.23	.25
Marital Happiness and Personal Adequacy	.26	.26
General Planning and Marital Happiness	.28	.27
SES and General Planning	.36	.36
SES and Personal Adequacy	.36	.37
SES and Marital Happiness	.38	.38
General Planning, Personal Adequacy and Marital Happiness	.29	.29
SES, Personal Adequacy and General Planning	.36	.37
SES, Personal Adequacy and Marital Happiness	.38	.38
SES, General Planning and Marital Happiness	.38	.38
SES, Marital Happiness, Personal Adequacy and General Planning	.39	.39

Table 4. Multiple correlations of combinations of two, three, and four selected factors with fertility-planning status.

to SES increases the original correlation of SES with fertility planning (.35) only to .39, hardly a substantial improvement.

In view of the apparent paramount importance of SES in this relationship, it is desirable to try to disentangle the important components of SES in order to narrow down the source of its influence. The four factors of husband's average annual income since marriage, husband's longest occupation since marriage, education of wife, and education of husband were selected from the total of the eight components constituting the

Table 5. Total and partial correlations of three components of socio-economic status with fertility-planning status.

Factors Correlated with Fertility-Planning Status	Wives				Husbands			
	Total Correlations	Controls for Partial Correlations			Total Correlations	Controls for Partial Correlations		
		Income	Occup.	Educ.		Income	Occup.	Educ.
Income	.26	x	*	.18	.26	x	.17	.17
Occupation	.23	*	x	.15	.23	.11	x	.13
Education	.24	.14	.16	x	.23	.12	.13	x

* Data relate only to husbands.

SES index.[14] Partial analysis[15] of these three factors (Table 5) reveals that income is slightly more important than education and occupation but the observed differences between the three offer little basis for assessing any real priorities of importance.[16] The coefficient of multiple correlation between these three factors and fertility-planning status is slightly lower than the original value of .35 for the SES index.

Planned Fertility

Turning now to the subject of factors associated with planned fertility, we will raise the same questions as we did in the analysis of fertility-planning status. Is SES again the dominant factor? What are the maximum predictive values that can be obtained for size of the planned family? One disadvantage of the distribution of completely planned family sizes in this study is its somewhat narrow range.[17] The bulk of the couples fall within the 0, 1, and 2 parity groups and thus require a high level of discrimination as far as prediction is concerned.

The correlation coefficients presented in Table 6 are generally lower than those observed for fertility-planning status.[18] There is, however, a radical change in the importance of some of our factors. Whereas the correlation of economic security to

[14] The remaining four components are net worth, rental value of the home, rating on Chapin's Social Status Scale, and purchase price of car.

[15] *See* Table 1 for the zero order intercorrelations.

[16] The restriction of the sample to wives and husbands with at least complete grammar school education might be expected to have a stronger lowering effect on the relation of fertility-planning status to education than to the other socio-economic variables on which no sampling restriction was made.

[17] Because of the inconsistencies, irregularities and extremely low correlational values obtained from the analysis of the "number planned" groups (205 couples who interrupted contraception in order to conceive their *last* pregnancy but who stated that they had had one or more previous pregnancies under other circumstances) the results of this group are not included in this article. The analysis is thus restricted to the more homogeneous group of 403 couples classified as "number and spacing planned" who either practiced contraception continuously and never had a child or who deliberately interrupted contraception in order to have every pregnancy. For convenience these couples are labeled "completely planned" in the present article.

[18] The correlation of fertility-planning status with the fertility of all couples (1,444) is −.58.

fertility-planning status was very low (.09 for wives and .13 for husbands, Table 2), it presents the highest of all correlation values with *size* of *planned* families (.32 for wives and .31 for husbands, Table 6). Moreover, this relationship is largely independent of SES. The values are reduced only to .28 for wives and to .27 for husbands when the index of SES is controlled. Of the three SES components listed, only income succeeds in partially reducing these values (.23 and .24 for wives and husbands, respectively). General planning and personal adequacy (not included in these tables) are almost completely negligible. For general planning the correlations are .01 for wives and –.04 for husbands; for personal adequacy, the values are .02 for wives and .09 for husbands. The slight relationship between marital happiness of wives and size of planned family appears to be largely a function of their joint associations with

Table 6. Total and partial correlations of six selected factors with size of completely planned families.

Factors Correlated with Size of Completely Planned Families	Total Correlations	Controls for Partial Correlations					
		SES	Mar. Happ.	Econ. Sec.	Income	Educ.	Occup.
		WIVES					
Socio-Economic Status	.16	x	.14	.03	*	*	*
Marital Happiness	.11	.07	x	.05	.04	.09	.10
Economic Security	.32	.28	.31	x	.28	.31	.31
Income	.24	*	.22	.09	x	.22	**
Education	.10	*	.08	.02	–.01	x	.07
Occupation	.09	*	.07	.00	**	.05	x
		HUSBANDS					
Socio-Economic Status	.16	x	.16	.05	*	*	*
Marital Happiness	–.01		x				
Economic Security	.31	.27	.31	x	.24	.28	.30
Income	.24	*	.25	.13	x	.18	.23
Education	.17	*	.17	.10	.04	x	.15
Occupation	.09	*	.09	–.01	–.06	–.02	x

* Indicates that correlation analysis was not performed because income, education, and occupation are components of the summary index of socio-economic status. A coefficient of approximately .10 is required for a statistically significant departure from zero at the 5 per cent level and a coefficient of .13 for the 1 per cent level of significance. The corresponding requirements for the deflated sample (N = 240) are .13 and .17.

** Data relate only to husbands.

income and economic security. The low zero order correlations between either education or occupation and size of planned family are virtually eliminated when either income or economic security is held constant.

The multiple correlations in Table 7 indicate that the zero order correlations between economic security and size of planned families (.32 and .31) are hardly improved to any degree by the addition of other factors. The maximum values obtained are .34 for wives and .35 for husbands which indicate the relation of planned fertility to economic security, income, education, and occupation simultaneously considered. The combination of economic security and income produces coefficients of .33 and .34 with planned size of family.

In an attempt to ascertain the role of childlessness in these relationships, 126 couples who had experienced no live births were eliminated,[19] leaving a group of 277 couples classified as completely planned *fertile* families. As indicated in Table 8, when the analysis is restricted to fertile couples, the relation of economic security to size of planned family is lowered substantially (.20 for wives and .14 for husbands). Holding income constant serves to reduce these coefficients even further

Table 7. Multiple correlations of combinations of two, three, and four selected factors with size of completely planned families.

Factor Combinations Correlated with Size of Completely Planned Families	Wives	Husbands
Education and Occupation	.11	.17
Education and Income	.24	.24
Income and Occupation	*	.25
Income, Occupation, and Education	.25	.26
Economic Security and Socio-Economic Status	.32	.31
Economic Security and Occupation	.32	.31
Economic Security and Education	.32	.32
Economic Security and Income	.33	.34
Economic Security, Income, Education, and Occupation	.34	.35

* Data relate only to husbands.

[19] It will be recalled that childless couples in the Study are mainly voluntarily childless in that they had always practiced contraception. The few exceptions are those having pregnancies that terminated in unintentional wastage.

Factors Correlated with Size of Completely Planned Fertile Families	Total Correlations	Controls for Partial Correlations					
		SES	Mar. Happ.	Econ. Sec.	Income	Educ.	Occup.
		WIVES					
Socio-Economic Status	.14	x	.14	.05	*	*	*
Marital Happiness[3]	.02		x				
Economic Security	.20	.15	.20	x	.12	.18	.17
Income	.19	*	.20	.10	x	.18	**
Education	.08	*	.08	.02	−.03	x	.03
Occupation	.11	*	.11	.05	**	.08	x
		HUSBANDS					
Socio-Economic Status	.14	x	.15	.09	*	*	*
Marital Happiness[3]	−.06		x				
Economic Security	.14	.09	.14	x	.07	.11	.10
Income	.19	*	.20	.15	x	.13	.16
Education	.14	*	.14	.11	.03	x	.09
Occupation	.11	*	.12	.05	−.02	.03	x

Table 8. Total and partial correlations between six selected factors and size of completely planned fertile[1] families.

* Indicates that correlational analysis was not performed because income, education and occupation are components of the summary index of socio-economic status. A coefficient of approximately .11 is required for a statistically significant departure from zero at the five per cent level and .14 for the one per cent level where N = 277. The corresponding requirements for the deflated sample (N = 165) are .15 and .20.

** Data relate only to husbands.

[1] Excludes childless couples.

[3] Total r considered too low for partial analysis.

to .12 and .07. The relations of income to size of these fertile families, on the other hand, is reduced only to .19 from the previous value of .24 with the childless families included and it is apparent that this relationship (.19) is slightly less dependent on economic security than it is for all completely planned families. The associations with the other factors remain approximately the same[20] except martial happiness which is now almost completely unrelated.

Summary and Evaluation

The chief aim of this interruption of the reports on the analyses of the Indianapolis Study hypotheses is to provide some in-

[20] Again general planning and personal adequacy exhibit negligible relationships. The coefficients are −.04 for wives and −.07 for husbands for general planning and −.03 and .00 for personal adequacy.

tegration and synthesis of the existing empirical findings as they relate to success in planning family size and size of the planned family. The particular hypothesis factors selected for this reanalysis are: socio-economic status, marital happiness, feeling of personal adequacy, tendency to plan in general, and feeling of economic security. Total, partial, and multiple correlations are the primary statistical techniques used.

The analysis of these factors in relation to fertility-planning status indicates quite clearly (for these data and summary indices at least) that SES exerts the predominant influence. The relationships of fertility-planning status with the "psychological" factors appear to be largely functions of SES. Some partial independence of SES is retained by marital happiness. On the whole, however, SES is the dominant factor of those studied in relationship to fertility-planning status.

The relationships of these various factors to size of completely planned family presents a different pattern. Feeling of economic security, in this instance, contributes the highest relationship. This relationship is largely independent of the SES index but is reduced somewhat when income is held constant. The exclusion of childless couples from the completely planned family group results in decreased relationship of completely planned fertility with economic security and a relative increase in the importance of income.

Analysis of the three major components of the SES index (income, occupation, and education) reveals that for both fertility-planning status and planned fertility, income has the greatest predictive sensitivity.

All of the correlation coefficients between the hypothesis factors and the two dependent variables of fertility planning and completely planned fertility are fairly low. The maximum proportion of the variation in the dependent variables that can be accounted for by multiple combinations of various factors is 15 per cent for fertility planning and 12 per cent for size of planned family. There are numerous possible explanations for the limited predictive values obtained. One possibility, of

course, is that the measurement of the various independent variables, particularly the personality characteristics, may have been inadequate. The Indianapolis Study was planned and designed in 1938–1940 before the comparatively recent innovations in scaling techniques. A more serious problem derives from the *ex post facto* nature of the Study design which results in the relation of answers to psychological questions asked in 1941 to reproductive behavior occurring at any time up to 15 years prior to that date. This same problem applies to a lesser degree to the socio-economic factors. There is an absence of control over the time sequence dynamics of all these relationships which only a longitudinal study could overcome. There is, of course, always the possibility that the psychological variables studied here may be less important for fertility behavior than others not included in the present analysis.

On the other hand, in view of the complexity and diversity of individual values and motivations associated with reproductive behavior, it may be somewhat futile to expect much higher prediction from a statistical analysis utilizing crude indices of certain sociological and psychological phenomena. It should be emphasized that such factors as SES and feeling of economic security are, at best, only predisposing conditions in their effect on fertility behavior. Feelings of economic security or insecurity, for instance, only facilitate or retard the operation of other more complex attitudes surrounding the having and rearing of children. In other words, our current predictive instruments only *indirectly* approach the problem and are successful in predicting fertility planning and fertility only to the extent of their correlation with the direct but more subtle factors involved. How common these latter factors are among different couples is a research question certainly deserving consideration in any future studies of this type.

EXPLORATION OF POSSIBILITIES FOR NEW STUDIES OF FACTORS AFFECTING SIZE OF FAMILY[1]

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TWO developments have conspired to create an interest in starting a new field study of factors affecting size of family. One is the fact that the Indianapolis Study of Social and Psychological Factors Affecting Fertility is nearing completion. The other is the dramatic increase in birth rates during the past decade. These situations prompted the Milbank Memorial Fund to devote one of its discussion groups at its 1952 Annual Conference to the topic Exploration of Possibilities for New Studies of Factors Affecting Size of Family. Three half-day sessions were devoted respectively to the subtopics: I. The Indianapolis Study; findings, weaknesses, and implications for future studies; II. New Techniques and Methods Available From Related Fields; and III. Suggestions Regarding Aims, Scope, and Methods in New Studies.

I. THE INDIANAPOLIS STUDY: FINDINGS, WEAKNESSES, AND IMPLICATIONS FOR FUTURE STUDIES

As a point of departure, Mr. Kiser presented a resumé of the Indianapolis Study and discussed some of the weaknesses of the data. His report on findings was restricted to those concerning the twenty-three hypotheses and since this is being published elsewhere[2] only the summary results (Table 1) and a few general statements will be presented here.

One of the most publicized findings of the Indianapolis Study is that of the direct relation between socio-economic status and fertility within the "number and spacing planned" group. The

[1] A report on the Round Table on Exploration of Possibilities for New Studies of Factors Affecting Size of Family, held in connection with the 1952 Annual Conference of the Milbank Memorial Fund at The New York Academy of Medicine, November 19–20, 1952. The participants are listed in the Appendix.

[2] Kiser, Clyde V. and Whelpton, P. K.: Resumé of the Indianapolis Study of Social and Psychological Factors Affecting Fertility. To be published in the November, 1953 issue of *Population Studies*.

average fertility of the total group of "number and spacing planned" families is low, but within the group fertility is directly rather than inversely associated with socio-economic status. Equally important, however, is the fact that within this "number and spacing planned" group, fertility is also directly associated with feeling of economic security of the couple. This relationship persists in slightly reduced form when socio-economic status is held constant.

The Study also yields some interesting relationships of fertility planning and size of planned family to other social and psychological characteristics. However, a fair generalization is that in most cases the relation of the other psychological characteristics to size of planned family tends to be weak or to be much reduced when socio-economic status is held constant. This situation is pointed up rather strikingly in the number of cases in Table 1 in which it was necessary to use the word "partially" in reference to the question "Has the hypothesis been supported?"

The failure of the Study to yield more in the way of psychological correlates of planned fertility may simply be the result of attempting to relate rather small differences in sizes of planned families to psychological attributes. The lack of sharper relationships could arise from (a) the actual absence of much variation in psychological attributes by fertility within the narrow range of family sizes considered; (b) the inadequacy or crudeness of the measures or scaling of the psychological attributes; and (c) the possible methodological weakness inherent in dealing with one hypothesis variable at a time. It may be noted, however, that a beginning has been made in "across the board" analysis of the data.[3]

Other or related weaknesses of the Indianapolis Study are:

1. *Inadequate Preparation.* This includes (a) the lack of an integrating theory or organizing principle for the twenty-three

[3] Westoff, Charles F. and Kiser, Clyde V.: Social and Psychological Factors Affecting Fertility. XXI. An Empirical Reexamination and Intercorrelation of Selected Hypothesis Factors. The Milbank Memorial Fund *Quarterly*, October, 1953, XXXI, No. 4, pp. 421–435.

Table 1. Indianapolis Study hypotheses classification and results of analyses.[1]

Class and Subject of Hypothesis	Hypothesis Number *See* Vol. II pp. 147–149	Published Article Number	Direction of Relation Found		Has the Hypothesis Been Supported	
			Fertility-Planning Status	Size of Completely Pl. Fam.	Fertility-Planning Status	Size of Completely Planned Family
(1)	(2)	(3)	(4)	(5)	(6)	(7)
I. *Status and Security*						
Socio-Economic Status	3	IX	+	+	Yes	No
Economic Insecurity	2	XI	−	−	No	Yes
Economic Tension	1	•	−	+	No[3]	No[3]
II. *Community and Family Background*						
Family and Childhood Situations	12	•	±	±	Partially	Partially
Residence and Migration History	11	XVI	±	±	Partially	Partially
Doubling-Up of Families	4	•				
Health of Wife and Husband	21	XIII	+	−	No[3]	No[3]
Health of Children	22	XIII	+	−	No[3]	No[3]
III. *Interest in Home and Children*						
Liking for Children	5	•	0	+	No	Partially
Children Wanting Brothers and Sisters	6	•	DNA	+	DNA	Partially
Parental Preference Re Sex of Children	10	XIV	DNA	±	DNA	Partially

Reasons for Second Child:						
Belief "Only Child" Handicapped	8	•	DNA	+	DNA	Partially
Desire to Insure Against Childlessness	9	•	DNA	+	DNA	Partially
IV. *Personality Characteristics*						
Personal Inadequacy	16	XVII	–	–	No	Partially
Feeling Children Interfere With Personal Freedom	7	•	–	+	No	No
Ego-Centered Interest in Children	18	XVIII	+	–	Partially	Partially
Fear of Pregnancy	23	XIX	+	–	Partially	Partially
Rationality of Behavior:						
Tendency to Plan	17	XII	+	–	Partially	Partially
Interest in Religion	15	X	–	+	Partially	Partially
Adherence to Traditions	14	XV	–	+	Partially	Partially
Conformity to Group Patterns	13	•				
V. *Marital Adjustment and Husband-Wife Dominance*						
Marital Adjustment	20	VII	+	+	Yes	Partially
Husband-Wife Dominance	19	VII	0	0	No[4]	No[4]

[1] Symbols:
• = Unpublished data—results preliminary (Col. 3).
+ = Direct relation with hypothesis variable (Col. 4–5).
– = Inverse relation with hypothesis variable (Col. 4–5).
0 = No relation with hypothesis variable (Col. 4–5).
DNA = Does not apply (Col. 4 and 6).
[3] Results believed to be spurious because of selective factors.
[3] Data on health very inadequate.
[4] Some results found on reformulated hypothesis.

hypotheses; and (b) inadequate conceptualization of some of the specific hypotheses; and (c) the lack of sufficient pre-tests of the validity and reliability of the psychological data.

2. *Deficiencies in Sampling.* This includes (a) the small size of the sample (even the inflated sample is too small to afford sufficient numbers in some of the crucial cells); (b) the limited possibilities of generalizing on the basis of a highly homogeneous sample in one area; and (c) the inadequacy of a uniform sampling scheme for all twenty-three hypotheses, some of which require specialized samples.

3. *Deficiencies in the Data.* This includes (a) the *ex post facto* nature of the data and the resulting difficulty of differentiating between cause and effect or between determinative and selective factors; and (b) the failure of the Study to provide any hint of the forthcoming baby boom, presumably due largely to the fact that it was restricted to women married 12–15 years at the time of interview (1941) and hence gave little or no attention to factors affecting marriage.

The listing of these weaknesses furnished points of departure for Ronald Freedman's discussion of implications of the Indianapolis experience for future investigations. He expressed the belief that some of the most significant findings from the Indianapolis Study might yet develop and he recommended that a small team of investigators be given freedom to range across the list of formal hypotheses and to combine and interrelate sets of data which have thus far been treated separately.

Dr. Freedman believed that one of the significant contributions of the Indianapolis Study is its provision of criterion data on the extent and effectiveness of contraceptive practice. The data are very convincing on the overwhelming influence of contraception as against other immediate factors in the general reduction of fertility. However, the data are limited in time and space and there is urgent need for similar data for a sample of the general population. Dr. Freedman urged that we should have on a national basis time-series data about the fertility norms and practices in order to establish bench marks

both for historical analysis and to provide a frame of reference for more intensive studies of the Indianapolis type.

Regarding the key-role of socio-economic status in fertility behavior, Dr. Freedman suggested that this variable should be one of the important take-off points for future studies. He thought that an important research objective should be that of determining what there is about style of life in different socio-economic classes that connects with different fertility patterns.

Dr. Freedman stated that in any study of fertility one encounters a mixture of factors that represent the residual influence of earlier historical forces and those that are indigenous to the current situation. He believed that the design of the Indianapolis Study served to minimize the influence of the "historical forces" and to emphasize the factors in the "current situation." This was indeed the case in that one rationale for concentrating the Study on an urban native-white Protestant group with at least a grammar school education was the belief that a group of this type, with knowledge of contraception, was setting the fertility pattern to which other groups would eventually conform. Furthermore, the emphasis on "recent" factors is evident in all of the hypotheses which are concerned with the relation of given variables to size of planned family.

Dr. Freedman believed that the sample design described above had been very productive for certain purposes. Thus, one of the most significant findings of the Study is that whereas fertility is inversely related to socio-economic status in the general population, it is directly related among those who plan family size most effectively. Nevertheless, he felt that the sample design was not appropriate to test some of the hypotheses which are really of an historical character, such as those concerning the roles of religion and tradition. Actually, of course, this is but one aspect of a general deficiency of having only one sampling scheme for the testing of twenty-three separate hypotheses—many of which would require specialized sampling schemes for adequate testing.

Dr. Freedman thought that in the Indianapolis Study the

measures of fertility phenomena were much better than the measures of the social and psychological variables. He regarded this as a natural consequence in a pioneering study which attempted to encompass a very wide range of variables. It was in fact frequently called an exploratory study designed to screen out factors of importance for future studies. It was not possible to experiment extensively with scales for each variable.

With the Indianapolis Study providing leads as to the substantive areas in which more intensive analysis might be most fruitful, future studies should concentrate on a smaller number of more generic hypotheses and much attention should be given to the development of concepts and measuring scales before going into the field for final data on the relation of fertility to the variables selected. He believed that a series of small-scale studies with extreme criterion groups might well precede any new large-scale study. He wished finally to say that students owed a considerable debt to the group that initiated and conducted the Indianapolis Study. Their work is notable not only for the significant substantive results obtained but also for the humility with which they have exposed each step to public examination. Their willingness to experiment and to reveal their problems as well as their successes makes the next steps much easier to take.

Discussion. Dr. Frank W. Notestein asked what would have been lost if the Study had dealt with wives only or with husbands only. Mr. Kiser was of the opinion that for most of the hypotheses relatively little would be lost. The extra expense and time required for including the husband was pretty large. It meant evening appointments for the interview in which the husband was included, so the field work was slowed down considerably. He agreed that for testing certain hypotheses such as marital adjustment, husband-wife dominance, and parental preferences regarding sex of children, data for both spouses are important. Dr. Samuel A. Stouffer and Dr. Reuben Hill were of the opinion that the husband-wife similarities and

discrepancies in replies to the same questions should be valuable classifications.

Apropos of Dr. Freedman's suggestion about the need for national data, Dr. Notestein thought it would be well to make a systematic analysis of the discrepancies between findings based upon indexes of certain variables and findings based upon short cuts such as self-ratings on the hypothesis question, interviewers' ratings, etc. He thought the results of such an analysis might shed some light on the value of national opinion polls regarding the influence of certain factors on family size.

Dr. E. Lowell Kelly expressed the view that before any new study is launched it would be well to follow Freedman's suggestion about "across the board" analysis of the Indianapolis Study materials. He suggested, in effect, some type of cluster analysis or factor analysis of the data with as many variables as possible included simultaneously. He thought that some such analysis might help to clear up the problem posed by the overriding influence of socio-economic status. What goes with socio-economic status? How many things are so tied up with this that we have had to treat it as a kind of single variable?

Dr. Burton R. Fisher was dubious about Kelly's proposal regarding factor analysis. In the first place, he thought it likely that there are many U-shaped relationships, especially with many of the socio-economic variables. In the second place, the assumption that "some milk and perhaps some cream" still remains in the Indianapolis data might be questioned. He preferred to see one choose from the first study those hypotheses that seem most profitable to retest and to proceed with a new study or a series of studies designed to get at given sets of variables. He thought that interpenetrating samples might enable one to relate a whole host of things that could not be accomplished in a single study.

Dr. Kelly replied that he was well aware of the possibility of curvilinear relationships and of the inadequacy of correlation techniques based upon linear relationships. He assumed that

a sophisticated analyst would not confine his efforts to a single global approach but would cut the data in some way to make it meet the criteria of the technique in question. Thus there might be a succession of analyses in which one would group data amenable to like treatment.

Dr. Balfour thought the comparative financial cost of reworking the existing data and undertaking a new study might have some bearing on the choice between these alternatives. The over-all costs of the Indianapolis Study and subsequent analyses, if the time and expense of all personnel are included, may show that the survey itself was by far the lesser part of the total cost. The setting up of a new study under current conditions, and possibly in a new setting, might be advisable rather than to continue the reworking of old data. Dr. Balfour, therefore, asked whether anyone could state the cost of the preliminary organization and collection of data in the Indianapolis Study as compared with the cost or expenditure for the analysis.

Mr. Kiser replied that a great deal of free service went into the planning and conduct of the Indianapolis Study and in the analysis of the data. He stated that the total grant from the Carnegie Corporation was $75,500 and that about $45,500 had been paid out by the time the field work was finished. Dr. Lowell J. Reed stated that in estimating the cost of further analysis of the data one should bear in mind that all materials are available on punch cards and that they can be mechanically transferred to new cards under desired arrangements at little expense.

Dr. Morton Deutsch thought the Indianapolis Study had suffered by the lack of an integrating theory. The twenty-three hypotheses which form the basis of the Study do not have any systematic relationships with each other; apparently no attempt was made to link the hypotheses explicitly to core socio-psychological conceptions. However, examination of the twenty-three hypotheses investigated by the Study and of the questionnaires suggests that implicitly the Study is centrally

concerned with areas of considerable theoretical significance: the social psychology of goal-setting and of planned action. Considerable research and theoretical writing has been done in these areas and it is likely that the Indianapolis Study could profit by applying to its own data some of the more theoretically-oriented questions arising from the research in these areas. Thus, it would be of interest to see if the Indianapolis data can provide answers to such questions as: Under what conditions does explicit goal-setting with respect to having children occur? What factors affect the goals which are set? What factors influence the stability of the goals which are set? What factors influence the effectiveness of action to achieve fertility goals?

The questionnaires employed in the Study do not provide the data necessary to a full answer to these questions. They do, however, give much relevant information, particularly about the personal and experiential characteristics of the respondent, which may determine the respondent's perceived causal structure with respect to certain kinds of events—i.e., the perceived events which lead to having or not having children and the perceived consequences of having or not having children. More explicit analysis of the different patterns of causal expectations which exist among the various respondents would provide an opportunity to link these patterns with personality, group membership, and experiential characteristics, on the one hand, and to goal-setting behavior and to the effectiveness of planned action, on the other hand. Once these linkages exist, it should be possible to link socio-economic variables, such as prosperity or depression, peace or war, political stability or instability to fertility behavior in a rational way rather than by hunch.

Dr. Wellman J. Warner thought the Indianapolis Study had made a distinct contribution simply by helping to clear the way for studies of motivation in relation to fertility. He believed there was some tendency, however, to expect of this Study something that it was not intended to be. It was not

set up as a longitudinal study and it could not be expected to yield classifications or results for which a longitudinal study would be required. However, some of the variables appear to be inadequately defined and hence poorly measured. He singled out "conformity to group patterns" which might mean a number of things. Actually, he stated, a social pattern is likely to be a more generalized norm which is then taken by the individual and synthesized into a range of situational factors in which the conformity may emerge as exactly nonconformity to what we have assumed the pattern to be originally. He emphasized the necessity of precision and specificity in definition and conceptualization of the variables to be measured.

Dr. Leonard S. Cottrell asked whether the Committee responsible for the Study had been called upon to make, or had found it appropriate to make, recommendations regarding policy. Dr. Thompson, Dr. Reed, and others replied that the answer was definitely "No." The belief that a Study of this type might furnish information of value to policy makers has been voiced as one of the reasons for making the Study but there was never any thought that the Committee would formulate a set of policy recommendations.

Dr. Thompson further stated that despite the shortcomings of the Indianapolis Study he, as a member of the Committee, was not disappointed in the results. He thought the Study had yielded much information of value and that it had helped to delineate the pitfalls to be avoided in future investigations. He recalled that in the early planning of the Study there was constant recognition of the fact that mistakes would be made, that the first attempt was regarded as an exploratory one, and that its function was to help prepare the way for future investigations in the field.

II. New Techniques and Measures Available from Related Fields

Sociology. Dr. Samuel A. Stouffer stated that he would not attempt to present a systematic review of techniques developed

by sociologists or anthropologists which could be used in any future study of social and psychological factors affecting fertility. However, as a sociologist, he was quite surprised to find that Hypothesis 13, Conformity to Group Patterns, was the only one listed in Table 1 on which no statement of results could be made. He suggested that when he and his wife were married some 25 years ago they were very conscious of the surrounding power and pressures of the social groups in which they were living. They knew that if they had had a child during the first year of marriage or as many as three children during the first four or five years of marriage they would have been subjected to strong controls of ridicule. It would have been taken for granted that they did not know any better. Nowadays, perhaps partly because knowledge of contraception is more widespread and partly because of changing values and sanctions, if a couple in an equivalent social position has three children during the first four or five years of marriage it tends to be regarded approvingly as happening because the couple wants the children.

Dr. Stouffer believed that if students are to get at the heart of social and psychological factors affecting fertility they must understand the values and sanctions, and particularly the sanctions of gossip and ridicule, that are prevalent in the immediate environments in which a particular family lives. He acknowledged the difficulty of studying these intangibles but he said that during the past ten years sociologists have been giving much attention to the problem of assaying values.

Dr. Stouffer believed that the efforts to determine the values of a particular social group had been helped a great deal by the new developments in scaling, most of which have come since 1941. In his opinion the important thing about the scaling technique is that it pretty well guarantees the uni-dimensionality of what is being measured.[4] He reported that he and other

[4] For a description of the H-technique in scaling, a modification of the scaling technique developed by Louis Guttman, *see* Stouffer, Samuel A., *et al.*: A Technique for Improving Cumulative Scales. *Public Opinion Quarterly,* xvi, No. 2, Summer, 1952, pp. 273-291.

sociologists had not been concerned too much with the study of a particular value as such but rather with conflicts of values and the extent to which people put one value or set of values higher than another value or set of values. As members of society we belong to different groups and some of these groups have conflicting norms. For this type of analysis the new scaling devices hold considerable promise.

Dr. Stouffer stated that one of the uncertainties in studies of the above type is our ignorance about the amount of confidence that can be placed in ordinary verbal responses that a person gives when he is interviewed quickly or when he is given a pencil and paper test. He reported that Dr. Borgatta had been cross-checking verbal responses of soldiers with their written responses to identical questions in order to secure some test of validity. Dr. Stouffer thought that a systematic cross-check of replies of wives and husbands to the same questions in the Indianapolis Study would be useful. Particularly valuable for indications of validity of conflicts are the replies to the questions requiring statements of wife's opinion, husband's opinion, wife's statement of husband's opinion, and husband's statement of wife's opinion.

In conclusion, Dr. Stouffer stated that he felt confident that with the newer techniques one could identify the major group memberships of respondents and determine the extent to which they feel identified; and that we could go further than the Indianapolis Study did in establishing the relation of "conformity to group patterns" to fertility behavior. He also believed that the application of scaling techniques to other variables such as "liking for children" might yield sharper relationships with fertility behavior than those observed.

Dr. J. F. Kantner stated that since he is responsible for analyzing the data on conformity, he felt impelled to comment on Dr. Stouffer's remarks. He noted that the hypothesis is something of a misnomer since most of the items were not intended as measures of the influence of group membership on fertility. They related rather to the more limited question of

how attitudes toward certain fertility-related matters, e.g., attitudes toward birth control ads, birth control clinics, proper spacing of children, the ideal number of children for people in moderate and well-to-do circumstances, etc., are associated with fertility. Items such as these show only a moderate degree of association with fertility and fertility planning. One item, however, is available that can be considered as measuring the influence of conformity to group norms. This is the average number of children of a couple's three best friends. Here, in line with Dr. Stouffer's expectations, a higher degree of relationship is found. For the relationship to fertility, $r = +.36$ among couples having no unwanted births. For the relationship to effectiveness in fertility planning the coefficient of contingency is $-.42$ ($P < .001$) with consistent differences to be observed with five socio-economic groups.

Mrs. Pratt stated that she had in fact experimented with scaling techniques in the data on liking for children without very good results. Similar reports had been given by other analysts—Ruth Riemer and Marianne DeGraff Swain.

Dr. Robin Williams wished to make three comments regarding Stouffer's remarks. He stated that during the past ten years sociologists had made much progress in operationalizing their notions about the importance of membership groups and reference groups, in the determination of human behavior. He stated that when we talk about norms we should mean not merely what people say *they* believe but also what judgments other individuals in the group have imparted to them. His second comment was that although the scaling devices had been used mainly for attitude scaling they might also be used for scaling objective behavior. The third comment was that in their attempt to study values, he and Edward Suchman feel that there are some real possibilities of getting directly at people's effective goals by the use of scaling techniques which involve putting people into choice situations and having them make their choices and justify them. He stated that this approach needs to be supplemented by behavioral evidence but

it has been used to advantage in field studies of inter-group relations in a number of communities throughout the country.

Dr. Freedman thought that if research workers are to get at situations of the type mentioned by Dr. Stouffer, it would be necessary to study the group context in addition to data on the individual. Thus one should not only interview the individuals but try to ascertain something of the character of the groups in which the lives of the respondents are anchored. Dr. Stouffer added that one should try to learn how much stake the individual has in the group and how relevant the group is to him.

Dr. Edgar F. Borgatta stated that the Indianapolis Study Committee and the several analysts had agreed to his experimental application of the H-technique of scaling to several groupings of the Indianapolis data. He listed thirteen areas (hypotheses or grouping of hypotheses) that he desired to test for scales. He felt that whereas this approach is the opposite of the one suggested by Dr. Kelly, it is for that reason complementary to it.[5]

Simplified Intelligence Tests. Dr. Norman Frederiksen discussed the possibility of using a short intelligence test in a survey situation. He stated that for a long time psychologists and people in psychiatric work have been looking for short cuts in the measurement of intelligence. The Kent Emergency test has been used rather widely and so have short sections of the vocabulary tests of Wechsler-Bellevue and Stanford-Binet. The principal objection to the use of these tests is that they contain free-response items and therefore considerable training might be required to bring the interviewers to a satisfactory standard of scoring accuracy.

Dr. Frederiksen listed the following as criteria for choosing an intelligence test for survey purposes:

(a) Appropriate content. (Probably verbal items should be used since attitudes are mediated verbally in large part.)

[5] Dr. Borgatta has subsequently carried out preliminary analyses of the thirteen areas and plans to extend the analysis further.

(b) Brevity. (The test should be as short as is consistent with acceptable reliability.)

(c) Fairness to older as well as to younger members of society. (This implies, for one thing, that the test should be unspeeded.)

(d) Freedom from influence of fortuitous factors. (Inclusion of a variety of content is one way to guard against any one person having an advantage because of unusual experiences.)

(e) Reasonable reliability. (A reliability coefficient in the range of .5 or .6 would perhaps be satisfactory for the present purpose.)

(f) A score distribution well above the chance score range.

(g) Objectivity in scoring.

After listing the above he gave his specifications for a test as follows: It should be a paper-and-pencil vocabulary test composed of about twenty multiple-choice items, administered without a time limit.

Dr. Frederiksen stated that after writing out the above criteria and specifications, he discovered an article by Robert L. Thorndike entitled "Two Screening Tests of Verbal Intelligence" published in a 1942 issue of the *Journal of Applied Psychology*.[6] This article describes two tests that were developed for use in a Gallup Poll for the purpose of investigating the relation of scores on the intelligence test to various voting preferences. The test that Thorndike recommended was a twenty-item multiple-choice vocabulary test; most respondents could finish the test in about ten minutes. Thorndike suggested that the reliability of the test for a population of wide range in ability was about .83. Dr. Frederiksen thought permission could be secured easily to use this test if desired.

Mr. Frederick Osborn stated that he had heard the opinion expressed that it would be possible in any questionnaire containing two or three hundred questions to word or arrange the questions in a manner that the replies would afford a pretty fair indication of the I.Q. of the respondent. He wondered

[6] Thorndike, R. L.: Two Screening Tests of Verbal Intelligence. *Journal of Applied Psychology*, 1942, 26, pp. 128–135.

whether that was based upon anything that had been done or whether it was just a presumption.

Dr. Kelly stated that a few years ago one of his students developed an intelligence key on the basis of strong-interest item responses in which the person never said more than "like," "indifferent," and "dislike." The key correlated about .60 with standard intelligence measures and it predicted school grade slightly better than did these same intelligence measures. Dr. Kelly didn't believe a person could respond to all of the questions in the Indianapolis Study without revealing a lot about himself, including intelligence.

Dr. Frederiksen stated, however, that definite hazards were involved in trying to ascertain intelligence by the indirect method suggested. Many of the measures thus derived are not independent, so one would be unable to use ordinary multiple correlation methods in the analysis. In general, he believed the direct approach with a short intelligence test would be more satisfactory.

Screening Test for Neurosis. Dr. Allister M. Macmillan, who has been experimenting with an amplification of a screening test used during the war to detect neuroses among inductees, emphasized at the outset that the technique is not one that is now "available for use." He explained that as a psychologist on Dr. Alexander H. Leighton's social research team studying mental health in the Stirling County area of Nova Scotia, his assignment was that of trying to develop a quick method of spotting neuroses in the community population as an adjunct to the psychiatric case-finding. The need was for a test which could be given rather quickly in a survey-like situation by relatively inexperienced interviewers. Furthermore, it was important that the test items be of a "non-offensive" nature when asked of a rural maritime population, of little psychiatric sophistication, without jeopardizing the rapport of the whole mental health study.

The fifteen "psychosomatic" questions developed and used by the United States during World War II, i.e., the NSA

(Neuropsychiatric Screening Adjunct) questions reported in the fourth volume of *The American Soldier* series,[7] appeared to be the type of items which answered the requirements fairly well since they were of the "forced-choice" variety favored by some leading clinicians (if one were to use a questionnaire rather than a projective technique). Also, the NSA items had formed a quasi-Guttman Scale in the Services situation giving some measure apparently related to neuroticism. Using these fifteen NSA items intact as a core, he added sixty other items with a health or social orientation to form a "Health Opinion Survey" (HOS), which was used in a community situation, similar to Stirling, and in a hospital situation in an experiment to make comparisons between the two in order to develop a scale before attempting measurements in the research area. In planning the experiment, it was realized that the "community situation" is considerably different from the "military situation" since the draftees had been torn from their normal surroundings and dumped into an induction center, while on the other hand it was felt that no particular problem would be encountered in asking the questions of people taking treatment in a hospital for neurosis. Like the soldiers, these people were in an unfamiliar situation. It was therefore believed that the situation for the community people should also be structured in an unfamiliar way. It was also realized that some concrete and meaningful inducement to take the test would be necessary in the community situation.

The solution was to use large mobile testing stations consisting of house-type trailers for all the community interviewing. These trailers were divided into cubicles. In the forward part was set up a Keystone telebinocular, a set of scales, and a weight measuring device. The people of the various communities sampled were told that they could get certain tests free in the trailer, including an eye-test. A cubicle at the other end of the trailer was used for the HOS interview, which lasted

[7] Stouffer, Samuel A., *et al.*: MEASUREMENT AND PREDICTION. Princeton, Princeton University Press, 1950, pp. 492–493.

approximately twenty-five minutes. The provision of height, weight, and eye test services not only served as an inducement to the people to cooperate, but also added to the unfamiliarity of the situation. The respondents were thus taken away from their home milieu where the presence of other members of the family might have influenced their replies to the questions. Also the "clinic situation" created in the trailer to some extent approximated the "Hospital situation" and permitted some degree of standardization.

The sample data were being analyzed at the time Dr. Macmillan gave his report. He could say, however, the comparison of the community and hospital series indicated that fourteen of the NSA questions that were used and twenty-nine additional ones stood up at the 1 per cent level of significance when done on a "whole-group" basis. The community sampling for this original standardization included a mountain area where farming conditions were poor, a valley area where the farming conditions were very good, and another area which was once a prosperous ship-building center but is now regarded as a poor farming area by the local agricultural people. In each case proportionate sampling of contiguous urban areas was done.

Because it was felt that there were differing modes of response to the "Health Opinion Survey" by these differing population strata, the preliminary analysis included statistical comparisons of these separate strata with the hospital neurotics and it was found that, of the forty-odd questions which showed statistical significance for combined groups, twenty were significant at the 1 per cent level in all the strata, and might therefore be termed "universal" for that region. Dr. Macmillan did not yet know whether it would be possible to develop actual scales for use in the comprehensive study. Further statistical analysis is planned with the help of Dr. Garnet McCreary, the project's statistician. If it proves impossible to develop scales or indices from the material, the twenty questions may simply be used operationally in the Stirling area as a rough screening device.

Measures of Personality. Dr. Angus Campbell emphasized at the outset that he knew of no standardized and validated personality measuring device which is now suitable and ready for use in a survey such as the one being considered. He thought the Indianapolis Study itself had been exceptional in its use of many questions regarding attitudes and values. However, if one thinks of personality traits as pervasive styles of behavior which characterize an individual in many kinds of life situations, one will be disappointed if he hopes to find a measuring device suitable for a survey situation. He emphasized that his remarks related specifically to the format of a population survey and not to possibilities of measuring personality of college sophomores, army recruits, or members of any other type of captive audience in which lengthy tests could be applied.

Several reasons for the infrequency of previous efforts to measure personality in surveys were mentioned. (a) The standardized and validated personality tests that are available are long and tedious. It is seldom that multiple interviews can be taken in population surveys and those who design population surveys generally find it necessary to cram everything into a single questionnaire that can be taken within the tolerance limits of the people being interviewed in their homes. (b) The necessary questions in a personality test are rather personal. (c) Few of the people designing surveys in the past have thought that the introduction of personality measurements would contribute enough in accounting for the variance in their dependent variables to make it worth while to include the questions. (d) Many of the personality tests that have been developed have been standardized for college students and would have to be rewritten for application to a general population.

For the above reasons, Dr. Campbell thought that anyone contemplating the use of personality measurements in a survey would be confronted with a whole separate problem. There must be a great investment in time and thought before the

questions are ready for inclusion in the survey questionnaire.

Dr. Campbell emphasized that he did not want to seem entirely negative in the matter and he described some of the experimental work now being done. He and his colleagues at Michigan have been experimenting with the F-Scale of the authoritarian scales. Leo Srole has developed a scale intended to measure "anomie." A number of projective tests have been devised in which the intent of the tester is not obvious to the one being tested. Recently Dr. Campbell and his colleagues attempted an experiment of this type in connection with a survey for the Civil Defense Administration. The objective was to try to find some means of measuring the degree of fear or insecurity which people felt regarding atomic bombing. Four small pictures were devised and there was variation in the order in which they were shown. Sometimes the two most drastic pictures were shown first; sometimes the other two. The individual was asked four questions: What is this picture about? What is the person thinking? What do you think will happen next? What do you think the other people might say it is about? The materials are in the process of analysis.

Dr. Campbell's conclusion was that much so-called projective interviewing [of the above type] is possible in the format of a survey. It requires careful planning and a certain level of ability in the interviewers. Measures of more generalized personality traits are still more difficult. In taking a population survey one must pay attention to the practical facts of the format of a sample survey, the tolerance of the respondent, the imposition on him, and so on. He stated, finally, that while there may be great returns yet to be realized in the area of personality measurement surveys, this area at the moment is still highly developmental.

Dr. Conrad Taeuber stated that the Census Bureau is sometimes asked to include certain questions, particularly in the Current Population Survey, that are outside the normal scope of census interests. For example, it could not consider asking any questions relating to personality until someone develops

a technique suitable for interviewers who have not received prolonged training for work of that type. However, about a year ago the Census Bureau was asked to conduct a survey on a series of mechanical aptitude and verbal aptitude tests in which the technique was that of having the interviewer appear at a door, introduce himself, list household members and designate a respondent. Using flash cards containing pictures or words, he would try to get the respondent to tell whether a particular screw shown in a diagram moved to the right or to the left, and to identify words, and that sort of thing. The whole purpose was to see whether a test of this type could be applied in the circumstances under which census operations are normally conducted. The results were remarkably good. In fact, the response rates were much better than those secured by one of the more sophisticated research organizations that had tried the same thing in the general population.

Dr. Stouffer wished to agree with Dr. Campbell's remarks regarding the impossibility of using elaborate personality tests in a study of the type considered. Short cuts are needed. But it is probably not the function of groups skilled in making surveys to develop suitable briefer devices. The briefer devices must be developed experimentally in university laboratories with available captive audiences in order to see how much relationship there is between the more elaborate procedures and the simple short cuts. There would still remain problems incident to the use of the short cut in a general population. The survey people should try them out in the field and send the results back to the laboratory for further refinement and adjustment. Dr. Stouffer insisted, however, that full-scale substantive studies of the type considered should not themselves be used primarily as testing grounds of the tools. The tools should be field-tested thoroughly before effort is made to use them in any large study of social and psychological factors affecting fertility.

Economics of Family Consumption and Standards of Living. Dr. Dorothy S. Brady discussed two findings that she thought

might have some bearing on problems of measuring the economic level of families in a survey. The first of these had to do with the relation between consumption and size of family. Two measures of this relation were briefly described. In the first plan, historical data tend to show with remarkable consistency that among families of similar income, the proportionate increase in consumption expenditures with increasing size of family tends to be only about one-sixth the proportionate increase in size of family itself. In other words, when income is held constant there is a definite down-grading of consumption expenditures per individual as size of family increases. The other measure, and one which needs further testing, is concerned with proportionate increases in income with increasing size of family that would be necessary to support a given level of consumption. Dr. Brady's data suggest that if a given level of consumption is to be maintained, the proportionate increase in income must be about two-thirds the proportionate increase in size of family.

The other general finding had to do with group standard of living. Dr. Brady drew a chart to indicate the manner in which broad occupational classes of the census type differed with respect to relation between average expenditures and average income. When consumer behavior in relation to income was thus traced from one broad occupational group to another the consumer expenditures were found to have an income elasticity of about eight-tenths. However, when the occupational groups were sub-classified by income, the correlations that applied to the individual occupational group yielded an income elasticity of only about six-tenths.

Dr. Brady suggested that the above finding might be relevant to some of the difficulties experienced in the analysis of Indianapolis Study data. If one has an hypothesis to the effect that the behavior of a family is in relation to its group standard, and if the group standards do vary, it is essential to eliminate the effects of the group standards first.

Dr. Brady stated that some of her current research indicates

that cities and communities differ widely with respect to interaction between the whole community level of living and the socio-economic groups within the community. We cannot say that wage-earner families against clerical families against professional families have any particular differences that are constant over all cities. Dr. Brady was of the opinion that there are variations in the group effect of the city on the individual and variations in the group effect of occupational classes on the individual and that in order to understand figures on income it may be necessary to place the families in relation to their groups.

Dr. Hill asked whether any of the consumption studies ever treated children as means of consumption satisfaction rather than as ends. Dr. Brady stated that she had sometimes considered this approach and that she once had an hypothesis that the difference between consumption patterns in 1918 and 1936 might have been due to the more frequent substitution of an automobile for a child in the later year. None of the analyses with which she experimented seemed to support that hypothesis but Dr. Brady emphasized the impossibility of making statistical comparisons of this type because this would necessitate putting a value on a child.

Dr. Stouffer was hopeful that the quantitative values of costs of children could be derived from the first set of data exhibited by Dr. Brady. Recognizing that certain complications are involved, he nevertheless thought that the cost of the child could be treated in rather strictly comparable terms with the cost of other purchasable commodities. He thought this approach would make sense, particularly with respect to families using contraception and free to choose between, say, an automobile and a child.

Dr. Joseph Spengler thought that the problem was more complex than Stouffer's suggestion would imply. For instance, the wife's disposition to work is not independent of number of children. Furthermore, some of the children may contribute to the family income in later years. The problem is not a

straight exchange of a child for a motor car unless income is standardized.

Sampling and Field Procedures. Professor Frederick F. Stephan explained that sampling and field procedures have developed very rapidly since the Indianapolis Study was planned and a whole week could be devoted to a review of them. In the limited time available he could only touch a few of the high spots. These are summarized as follows:

(a) To derive maximum benefit from the new techniques in sampling and field procedures, it is necessary to make up our minds more definitely today than in 1940 as to what we want in a survey, and the reasons for, and the contemplated uses of, the data that are to be collected. Until we know what analyses are to be made we do not know what type of data to get. Until we know what data to get we do not know whether we should get a few families or many, whether we should try to get a sample enriched with certain types of families or a simple cross-section of the population, and in considering various other possibilities whether to use one type of sampling procedure or another in attempting to obtain the maximum yield of information out of the whole enterprise.

(b) Usually we have several objectives and we want more than we can get with our powers and resources. Hence to apportion our effort wisely it is necessary not only to determine in advance rather precisely what we want but also to arrive at some judgment about the relative values of the principal results we would like to obtain. Thus in connection with the proposed study it is essential to decide whether it is more important to have the study concerned with the determination of *causal relationships* or with finding out what is the *actual distribution* in our population of certain factors that are related to childbearing. The choice between these objectives will depend greatly upon the particular interests of the group that is responsible for the survey. However, a discussion like ours should attempt to assess the relative importance of the two types of objectives and this should be done within the context of the deeper problem as to which type of result is more likely to move us along fastest

toward the ultimate goal of having a well-rounded understanding of the questions that concern us.

(c) Before undertaking another study of the type we are considering we might give some thought to the relation of this study to the whole field in terms of the "strategy of research." Thus if it can be assumed that other research groups are going to undertake certain studies in this field, what can we do that will most advance the whole common effort toward comprehensive and thorough understanding?

Once these decisions are made we begin to know pretty definitely what it is we want to seek in the way of data and for what purpose. Assuming that we also have some notion about the level of accuracy of different types of data desired we are then in position to raise questions about the tools and techniques available for collection and analysis of the data. A few of these are listed below.

(d) A powerful method of arranging complex experiments by "factorial design," originally developed in agricultural research, is being extended into psychological experimentation and other fields. In the classical method of setting up an experiment only one variable is manipulated at a time. Thus seeds of a given variety may be planted in several plots and each plot treated with a different fertilizer. In such a comparison of the effects of fertilizers, the use of a factorial design permits one to compare simultaneously and on the same plots the effects of insecticides, the results of different methods of cultivation, and other factors. To accomplish this it is necessary to subdivide the plots or increase their number but all plots may contribute to each comparison. Experiments of this type require careful planning and in their early history they taught the lesson that the help of the statistician should be enlisted in designing as well as analyzing the experiment.

One consequence of factorial design is that it frees one of the necessity of having a highly homogeneous sample in order to control the major variables. If properly done, a considerable range of variation may be incorporated in the design to accomplish this end. The relationships that are discovered may then have validity over a wider range of populations.

(e) Scientific principles are being applied to the operation as well as the design of surveys. The whole survey operation is considered to be a system directed to the production of specific results as economically and effectively as possible. Previous surveys are analyzed and preliminary trials are run to obtain information about cost, accuracy, and other criteria needed to determine the optimum size and distribution of the sample, the optimum length and procedure for the interviews, the best apportionment of time between training and field work, and the best answers to many other technical problems. In this respect the scientific approach to conducting a research survey serves a function similar to that of studying the production process in a factory in order to ascertain what number of workers and machines and what level of quality of materials are needed to give the greatest yield of end product. Similar approaches to complex operations have been developed in industry as well as agriculture and science. They were applied to many military problems during World War II. The Operations Research Society was organized recently to foster their development and wider application.

(f) There have been important advances in the study of change. Longitudinal studies offer a means of observing changes as they occur over a period of time. Cross-section studies observe at a single time a succession of groups at different stages of development. Both approaches present difficulties. In a longitudinal study the panel of individuals may be affected by the progress of the study itself. In a cross-section study of change, groups in different stages of development may not have had comparable experience at each stage and hence cannot be regarded as strictly equivalent to a single cohort passing through life. There have been a number of significant studies conducted by repeated interviewing and also theoretical advances in analyzing processes of change psychologically and mathematically, all of which could contribute to the planning of future studies of fertility.

(g) Methods have been developed for increasing the accuracy of estimates derived from surveys and also contributing to their analysis and interpretation by utilizing information from other sources. This utilization of collateral data may affect the design

of the sampling, the content of the schedules, and other aspects of a survey operation. Hence it should be considered in the original planning.

(h) Improvements in the means of observation and the measuring instruments employed in surveys are of great importance. The training of interviewers should emphasize the possible biasing effects of failure to contact clients or to get their full cooperation or to conduct the questioning effectively. The use of the mails, telephones, and inquiry from neighbors should be increased in order to reduce the number of "not founds." Interviewers can easily invite refusal to give information about income, contraception, etc. by betraying their fear of a refusal in the manner in which they ask the question. The selection of interviewers is highly important for their abilities, motivation, and attitudes may determine the value of the results more than any other part of the survey.

(i) Sampling can be applied within the interview as well as in selection of respondents. The possibility of refusals and the risk of securing abbreviated and inaccurate replies tend to increase with the length of the questionnaire. One technique is that of rotating questions and not asking all of the questions of all of the people. This plan was followed, for example, in the 1950 Census of Population and Housing.

(j) The practice of assessing the accuracy of surveys, so notably pioneered in the Indianapolis Study, is becoming an essential part of all survey reports. Not only must surveys be designed to give accurate results but the degree of accuracy actually attained must be estimated for the guidance of all who make use of the results. The use of parallel sub-samples provides a useful way of getting approximate estimates of sampling error or tests of significance. Thus in the analysis the total sample might be divided into ten sub-samples that are alike in all respects except size. It is then possible to secure a set of estimates for each of the sub-samples in order to yield a frequency distribution of sub-sample results. From these an estimate of sampling variance may be secured. Methods of estimating or allowing for survey bias are equally important but still inadequately developed.

(k) A more sophisticated attitude toward tests of significance has spread through the ranks of research workers. Chance alone will account for about 5 per cent of all tests that are found to be "significant" at the 5 per cent level. Tests for significance must be applied with due allowance for the fact that one has accepted a certain risk of having non-significant items turning out as significant.

(l) Professor Stephan emphasized the importance of making quantitative estimates of qualitative variables and conducting quantitative experiments so that one may increase the precision of results and so "creep up on the truth." This involves the development of mathematical models and the deduction of results from them for empirical testing. It is particularly important if the chief objective is that of studying causal relationships rather than to determine the prevalence of given characteristics in the population.

(m) Noting that some of the hypotheses in the Indianapolis Study when taken two or more at a time do not lead to any definite conclusion, Professor Stephan emphasized the need for a more general theory or organizing principle incorporating the separate hypotheses that will specify the results of differences (or changes) in two or more conditions affecting the same population. Ordinarily this requires a replacement of the present elementary statements of inequality by a set of quantized relationships. When models are devised to express such a set of hypotheses, the results should have more meaning in terms of causal relationships than the present formulations have. Then we will be able to design empirical studies that will move us ahead more rapidly toward realizing the ultimate objective, whether that ultimate objective is making recommendations for policy, giving the data to people who will make the recommendations, or merely adding another chapter to the growing body of basic social science and knowledge about human behavior.

Discussion. Dr. Stouffer thought it well to issue a warning that the system of rotating questions might easily lead to heartbreaks in the analysis. Professor Stephan agreed that one might easily regret it later if he made a judgment in advance

that certain questions would be asked of only some of the people. However, that principle was applied to the fertility questions in the 1940 and 1950 Censuses. The questions on fertility probably would not have been asked at all if they had to be asked of all the married women. Sampling of this type is often a compromise which may lead to heartbreaks.

Mrs. Lee F. Herrera stated that the factorial design was quite applicable in agricultural studies but she had difficulty in visualizing its extensive use in social science, particularly in surveys of the type considered. New variables corresponding to fertilizer and insecticides cannot be introduced—we must take the variables that exist in the population.

Professor Stephan agreed about the difficulties. He stated that certain modifications in factorial design probably would be needed for application to social science. However, he pointed out that certain aspects of factorial design were in fact introduced in the Indianapolis Study when it was decided to sample on the basis of fertility-planning status and size of family. He also pointed out that the demonstrated importance of socio-economic status indicated the wisdom of making further studies, either in a new survey or from the materials in the Indianapolis Study, with a view toward discovering what aspects of this vaguely defined term are really important.

Professor Stephan acknowledged that the interrelationship of the components of socio-economic status (such as education, occupation, and income) imposes a limitation on the application of factorial design. However, it is possible to design a sort of "staircase analysis" in which adjacent occupational or income groups are compared. He emphasized that more knowledge of the specific problems involved was necessary before maximum use could be made of factorial design in the social sciences.

III. Suggested Aims, Scope, and Methods of a New Study

Mr. Frederick Osborn thought that, as in the Indianapolis Study, the general aim of any new study would be an increase

of knowledge of factors affecting fertility. He doubted the necessity of being concerned over whether or not the factors investigated will affect policy. We are not living in a vacuum and we might well be motivated by the feeling that the prospective study should be of great importance to problems of policy. However, we can rest assured that any important factors affecting fertility will be of interest to policy makers. That matter will take care of itself.

As to scope, Mr. Osborn thought the new study should include provision for investigating the relation of personal characteristics to fertility. In view of Dr. Campbell's remarks he realized the difficulty of incorporating personality tests in surveys. However, he hoped that certain types of personality characteristics might be amenable to measurement in a survey. He thought that some type of neuro-psychiatric screening test such as that described by Dr. Macmillan might be tried. He presumed that some means of testing general intelligence, either with a short test such as that described by Dr. Frederiksen or by using the replies to other questions as described by Dr. Kelly, might be used.

As for type of couples to be studied, Mr. Osborn thought that the new study should concentrate, as before, on those using contraception but that special efforts should be made to secure more large families that are planned as to size.

Dr. Jessie Bernard hoped that at least some consideration would be given to the possibility of a fertility study in a country where the population problem is really acute. She thought that a very useful job could be done in India, studying and comparing couples that do and do not limit births.[8]

Dr. Bernard also felt, however, that new studies of factors affecting size of family are needed in the United States. She

[8] Attention may be called to the fact that the United Nations and the government of India are currently sponsoring a field study of population in relation to economic and social factors in the State of Mysore.

See Durand, John D.: United Nations Population Study in India, a paper in Approaches to Problems of High Fertility in Agrarian Societies. The Milbank Memorial Fund, New York, 1952, pp. 153–158. Some of the questions asked in the Indianapolis Study were incorporated in the schedules for the study in India.

believed that the whole climate of thought regarding marriage and the family had changed greatly since the time when the Indianapolis Study was planned. At that time the public concern was over the low birth rate. We are now in the midst of a high birth rate and a study valid for the conditions of the 'thirties may not be valid for those of the 'fifties.

Dr. Bernard emphasized the fact that people are members of both publics and groups and that we cannot hope to understand them unless we know what publics they belong to and are being subjected to and what groups they are identified with. She, therefore, suggested that in any new study the units of investigation be changed in certain respects. Some of the Indianapolis hypotheses were concerned with the impact of the group but the Study was designed in terms of the individual.

Individuals are affected by gossip and by group norms and conflicts of norms of the type that Dr. Stouffer had mentioned. Dr. Bernard has long been much convinced, for example, about the role of fashion in fertility. She has noted a definite upward trend since the 'thirties in the number of children that girls in colleges say they would like to have. In recent years the women's magazines such as *Glamour, Charm,* and *The Ladies Home Journal* have helped to glorify maternity by showing modern fashions in maternity clothing. There is now a fashion in natural childbirth.

A study of the influences of gossip, group norms, and fashions on fertility requires an interdisciplinary approach. A communications analyst might be called in to assess the impact of the mass media. What filters through to the people? How do fashions and other collective norms start and how are they propagated?

Dr. Bernard believed that in any group there are people who become models for others to follow. Thus Mary and Helen might belong to the same bridge club. When Mary has a baby all of the others want babies. If Helen has the baby the idea is not so contagious.

As for methods of study, Dr. Bernard noted that the same Indianapolis Study sample was used for testing different hypotheses that really required different types of samples. She suggested that a "sample bank" might be considered. Thus a brief preliminary survey of a total city such as the Household Survey of Indianapolis might give some indication of the general characteristics of the population. Then for specific hypotheses one might select a separate sample for study pinpointed to the specific requirements of that hypothesis. This would multiply the number of families in the total sample but it would reduce the load of questions on the respondents in each specific sample.

Dr. Bernard also endorsed the idea of the longitudinal study and suggested linking it with some type of experimentation. Thus it might be possible to set up two matched samples of young couples, supply one group with some type of family allowance for children, and observe the patterns of family growth in the two groups over a period of ten years.[9]

Dr. Reuben Hill stated that his effort to make suggestions for a new study would partake of his current experiences in Puerto Rico. The situations were parallel in that a previous study of broad scope had been made in each case. Thus Paul Hatt's *Backgrounds of Human Fertility in Puerto Rico* was the counterpart of the Indianapolis Study and in each case a new study was desired. In the current study in Puerto Rico, which Dr. Hill is directing, the emphasis is placed on the factors affecting the planning and controlling of family size rather than size of family.

Dr. Hill stated that he definitely agreed with Dr. Cottrell about the importance of framing a study in terms of its potential value to policy makers. In view of the pressing problems

[9] An experimental study of this type has been carried out by Flanagan with the help of the Pioneer Fund which sponsored it. The Pioneer Fund offered educational scholarships to children born to regular officers in the Army Air Corps during the calendar year 1940, provided there were already at least three other living children in the family. A brief report on the accomplishments of this study is included in Flanagan, John C.: A Study of Factors Determining Family Size in a Selected Professional Group, *Genetic Psychology Monographs*, 1942, xxv, pp. 3–99.

in Puerto Rico one is not justified in undertaking social research in that area simply for the purpose of satisfying scientific curiosity or for the purpose of contributing to methodology. It should be framed with reference to its possible use not only by those who will make new studies but also by those in social work and by those concerned with policy.

The family as an interacting group was taken as the unit of study in Puerto Rico. Dr. Hill acknowledged that the husband-wife pair are the major actors in family planning but he emphasized that the offspring exercise significant influences at later stages of the family cycle. Moreover, in a real sense the husband and wife act as agents of the family in their thinking and planning.

Dr. Hill stated that he and his colleagues had looked in vain for a conceptual system which might have rendered theoretically relevant the twenty-three hypotheses in the Indianapolis Study. To provide such an organizing framework in the Puerto Rican Study they agreed upon "the interactional frame of reference" which lends itself well to the study of the family as a planning and decision-making association.

Some of the component concepts of the "interactional frame of reference" are (a) status and inter-status relations, which become the bases for authority patterns and initiative-taking; (b) role, role conceptions, role taking, role playing, and role organization, with parents viewed in role-playing and children viewed in role-taking terms; and (c) processes of communication, consultation, conflict, compromise, and consensus.

Dr. Hill believed that the interactional approach provides not only the tools for observation but also a pool of theory that can be drawn upon in the formulation of diagnostic study questions. Thus from family-interaction theory and its close relative, structure-function theory, come questions which may be used in the quest for the social-psychological antecedents of success in fertility planning and control. These antecedents differ in quality from the psychological and socio-economic correlates of fertility in the Indianapolis Study. They partake

of the dynamic quality of interaction systems and are oriented to intra-group processes rather than to traits, characteristics, and status categories.

Dr. Hill stated that the family is intermittently concerned with what Robert B. Reed called negative and postive aspects of fertility planning among the Indianapolis couples.[10] The family is thus perceived to be the chief decision-making unit with respect to control of family size and the Puerto Rican Study is concentrating on intra-family communication in the decision-making process. Conditions favoring and impeding communication will receive major attention.

Questions designed to explore this dimension of family life were tried out in a preliminary study by Stycos and Hill.[11] The January, 1953 issue of *The Annals* presents some of the possibilities of birth control in Puerto Rico as determined by preliminary application of the study design described above to this problem.[12] A quantitative verification phase of research into the problem is being undertaken by study of 1,000 families during 1953–54.

As to research design, Dr. Hill strongly recommended that in a new study in the United States reconnaissance precede definitive study. He recommended as a guide the descriptions of exploratory research in Jahoda, Deutsch, and Cook: *Methods in Social Research.* In conclusion, he stated that he had tried to illustrate with the Puerto Rican study the use of family-interaction theory to high-light the empirical situations that need exploring by probing questions. Answers to the diagnostic

[10] Reed, Robert B.: The Interrelationship of Marital Adjustment, Fertility Control, and Size of Family. A paper in Whelpton P. K. and Kiser, Clyde V. (Editors): Social and Psychological Factors Affecting Fertility, Vol. II. The Milbank Memorial Fund, New York, 1950, pp. 270–276.

[11] For a description of this preliminary study, *see:*

Hansen, Millard: The Family in Puerto Rico Research Project. A paper in Approaches to Problems of High Fertility in Agrarian Societies. The Milbank Memorial Fund, New York, 1952, pp. 50–61.

Stycos, J. Mayone: Family and Fertility in Puerto Rico. *The American Sociological Review,* October, 1952, xvii, No. 5, pp. 572–580.

[12] Stycos, J. Mayone and Hill, Reuben: The Prospects of Birth Control in Puerto Rico. *The Annals* of the American Academy of Political and Social Science, January, 1953, *285:* pp. 137–144.

questions, phrased in terms that the respondents can understand, provide hypotheses of a practical and applied dimension in social psychology which, if tested and confirmed, would add to knowledge that can be used by agencies working directly with families in their fertility problems.

Dr. Leonard S. Cottrell listed several possible criteria or bases for selection of questions to be investigated in any new study of fertility. In the first place he wanted to make it clear that his previous comments about gearing studies to policy implications did not mean that the long-held and cherished rights of scientists to follow the bent of their curiosities should in any way be impaired. Therefore, he would say that whatever those responsible for any new study are most curious about should be a good guide to the formulation of aims of the study.

The chief problems or interests that have emerged from the Indianapolis Study might be good guides for future planning. Thus the tremendous importance of socio-economic status might be used as a point of departure. The dynamics of status have hardly been touched upon and the conditions and processes involved in the placement of a person, both in his own mind and in the minds of others, on any kind of value or status scale, would seem to meet the highly relevant salient as to the selection of problems and what determines the decisions with respect to having or not having another child.

Dr. Cottrell stated that one of his students and also Louis Guttman had once done some research on the relation of personal adequacy to socio-economic status and social mobility. Their results were similar in that they found at least enough evidence for an hypothesis that as individuals approached a critical boundary between their class and the next higher step in the social level their feelings of inadequacy or inferiority develop quite markedly. Once they get safely beyond the critical boundary their feelings of adequacy and superiority mount sharply. Dr. Cottrell suggested that this hypothesis in relation to fertility might well be tested. It would afford classifications

on the basis of dynamic phenomenon and it would take into account the reference group orientations, the value and goal aspiration levels, and more relevantly the factors in the field of perception, such as the having or not having of children, which enhance or inhibit the chances of realizing these goals.

Dr. Cottrell also endorsed the suggestion that a more general type of theoretical structure be developed and that specific problems or hypotheses for testing be derived from this more general theory.

Finally, Dr. Cottrell referred again to the matter of policy. He stated that he was particularly interested in this matter because one of his current professional activities is that of determining how social-science activities can be made more available and more usable in the field of practical action. He thought it would be quite valuable and proper from a scientific standpoint, for instance, to try to ascertain for a given segment of society the processes, dynamics, or interventions that might be required to encourage higher or lower birth rates.

Dr. Frank W. Notestein thought that any consideration of whether a study should be concerned with policy should take into account the many and subtle relationships that condition the scale and nature of childbearing. Many of these probably are tied up inextricably with the whole process of social change and there is the question as to whether fertility habits can be changed without manipulating the whole environment. However, if usefulness of a study for policy makers is an important consideration, some special emphasis might be given to exploring the effectiveness of those things that might be done by sharp intervention on a limited scale. This might simply dictate some selection of interests of the investigators.

One of the specific problems that might be dictated by desire to have a new study useful to policy makers is that of the reasons for the increase in the marriage rate during the past decade. Dr. Notestein pointed out that only about 11 per cent of the females 25–29 years of age were reported as single in 1951. This was once the residual rock-bottom proportion of

spinsters at the end of the childbearing period. Since the trend toward earlier marriage has been an important component of the increase in the birth rate, the conditions affecting marriage as well as those affecting fertility might well be included in a future study.

Dr. Notestein also emphasized the importance of trying to ascertain the reasons for the very sharp relationships of fertility behavior to socio-economic status as compared with its weak relationship to attitudinal responses. In this connection he thought it would be strategic to give special attention to those aspects of the Indianapolis Study that did yield fairly rich results, such as economic security, personal adequacy, and marital adjustment.

Dr. Notestein was of the opinion that something rather unpredictable accounted for much of the change in the fertility situation during the past decade. Marriage and fertility behavior appeared to be very little oriented to the long-run position and the present came greatly into immediate importance. He would like to see a study grapple with the reasons for this apparent change. He agreed that fashion might be an important factor. However, he emphasized that the problems involved are complex and difficult.

As for method, Dr. Notestein agreed about the need for sharper scaling but he believed that scaling deficiencies were by no means the fundamental weakness of the Indianapolis Study. If the characteristic is sharply defined the results will show up with only crude scaling. He doubted that one could devise scales of socio-economic status sufficiently poor to obscure the relation of fertility to this variable. Dr. Notestein did suggest, however, that the next study might give more attention to inter-pregnancy intervals than had been done thus far in the analyses of Indianapolis data.

Dr. Notestein thought that the preceding discussions had emphasized the complexities and difficulties that would be encountered in a new study. He believed that the development of plans for a new study should proceed with great care and

that the materials in the Indianapolis Study should be exploited to the full in planning the next study. This adds up, he thought, to the desirability of having a one-year seminar with membership drawn from a variety of skills and institutions and staffed with at least one or two full-time people whose business it would be to see what could be gotten out of the Indianapolis materials as guides for the next study. The analytical jobs required might well be farmed out to different members of the seminar willing to take them. Following this, another year or two might be devoted to detailed planning of a series of next steps. These next steps themselves might be farmed out to persons or institutions having the particular skills needed. The tooling up stage and perhaps any final study might be decentralized in this manner.

He suggested finally that the proposed seminar might be concerned with ways and means of linking special studies to the more general and conventional information available from the Census and National Office of Vital Statistics and, alternatively, to see how further analyses of the more general types of data might be directed in ways that will make the special studies more fruitful.

Discussion. Dr. Freedman thought the proposed seminar might well afford a means for testing some of the specific suggestions that had been made at the present meeting. A relatively small group might undertake to develop a theoretical construct and perhaps some of the derived specific problems. Some of these specific problems might be tested in part from the Indianapolis materials. Others might require small-scale studies for which some funds should be available. There are certain lines of experimental work that could be done for testing the instruments and procedures. The small-scale experiments might be an economical way of telling us what is practical for a large field study.

Regarding the linking of special studies with official data, Dr. Dunn stated that it might be possible to have the Census Bureau include certain questions of relevance to the special

study in one or more of the Current Population Surveys. For instance, through this device it might be possible to identify families having births during a particular month. Then through a collaborative means of follow-up it might be possible to secure additional information from these families. A bridge between the specialized studies and official statistics might help to interpret secular trends in marriage and fertility. It might broaden the interpretive base of the official data and also provide a wider bench-mark base of official data to which one could tie a considerable number of the special studies that are now cross-sectional in nature and rather isolated from their broader significance.

Dr. Daniel O. Price suggested that the establishment of some sort of coordinating committee on research in fertility also might help to broaden the interpretive base of specialized studies. He was hoping to start some type of longitudinal study of selective migration at the University of North Carolina. He thought it possible that one or two specific hypotheses on the relation of migration to fertility might be tested in such a study. There may be other hypotheses that could be farmed out to other studies in prospect.

Regarding Dr. Dunn's comments, Dr. Conrad Taeuber stated that it might also be possible to use the 1950 Census fertility sample to put the findings of the Indianapolis Study in a broader framework. Thus it might be possible to replicate the Indianapolis sample in several important respects such as nativity, color, age, duration of marriage, and education, and ascertain whether the Indianapolis Study really failed to predict the fertility of couples of the type that were studied or whether the baby boom arose from the different behavior of population groups with other characteristics.

Dr. Hill suggested that if the interviewers had gotten closer to the families studied they might have picked up some indication of a forthcoming increase in the birth rate. Dr. DeVinney doubted that this was necessarily true. He recalled Whelpton's statement that women of the same age as those in

the Indianapolis Study had contributed little to the increase of the birth rate. If the study had dealt with newly married couples, it might have given some evidence of what was to come. However, among the couples studied (married 12–15 years) approximately one-half of the conceptions were not wanted, at least at the time that they occurred. Therefore, the closer the interviewers got to these couples, the closer they might have come to the assumption that birth rates would be still further depressed. The notion that the future trend will be revealed just by getting close to a group of families may be a little treacherous unless one is making a very sophisticated analysis of the actual forces and causal relationships that are involved.

Dr. Thompson urged caution in acceptance of the belief that a fundamental change in reproductive behavior had occurred. He stated that the evidence is not yet adequate to justify the conclusion that there has been any actual increase in size of family. He thought one should await the cohort studies and tests of the type that Dr. Taeuber mentioned before concluding that an increase in average size of completed family has occurred. It is possible that the average size of completed family is unchanged despite the earlier marriage and change in timing of births. He agreed, however, that apart from size, change in timing is an important change in fertility behavior.

Dr. Wilbert E. Moore noted that several speakers had emphasized the importance of broad social changes. At the risk of reading himself out of the sociological profession he would urge the planners of the next study not to abdicate their responsibilities to the central purpose of the study. The ultimate aim, as he saw it, was to predict intimate individual or paired behavior within a given social context. Thus the study should be focused on motivation. He further suggested that if one is interested in potential changes in a situation, the deviants become of great importance.

Dr. Moore believed that the previous discussions regarding

tensions, security, questions of whether or not cognitive planning is undertaken, the time dimensions of the planning, etc. all pointed rather clearly to the need for concentrating the study on tensions of the individual as he fits himself into the social system. He thought that this type of approach would enable one to get further with reference to the circumstances necessary to get people to take a rational or at least a cognitive orientation toward their behavior in marital relationships and childbearing. He agreed with previous speakers about the need for further tests of the relation of verbal response to actual behavior.

Dr. Joseph J. Spengler stated that the child could be regarded as a package of utility and that fertility could therefore be analyzed in terms of the family's consumption pattern. He suspected that much of the change in the birth rate could be interpreted in terms of changes in consumption patterns. He therefore suggested that the next study provide for an investigation of the relation of changes in family income through time to changes in consumption patterns (including the having of children). Retrospective data of this type might be collected in a single survey but the ideal would be a longitudinal study in which the various changes are recorded as they occur.

Dr. George J. Stolnitz said that some of the remarks that had been made about socio-economic variables on the one hand and attitudinal and personality variables on the other, pointed up the need for making an important distinction regarding objectives of any future study. This is quite apart from the relative success in measuring the two types of variables. If the major objective is that of predicting fertility trends for the general population of the United States it is perhaps more important to have good data by socio-economic status than by attitudes. This arises from the fact that Census data provide a basis for weighting the rates by socio-economic status according to the importance of these classes in the general population. In contrast, there is no direct basis for weighting fer-

tility rates that are distributed by attitudes or personality traits in the general population. However, if the chief objective is that of studying the motivations and personality characteristics in fertility, the attitudinal data are obviously needed.

Dr. Bernard liked the idea of farming out separate parts of a study to individuals or agencies having the special skills required. She would extend this principle to any final study. She thought it unfortunate that in this country the tendency to regard something big as good had extended even to attitudes towards research. Dr. Macmillan agreed in terms of the development of techniques and stated that during the past hundred years much of the outstanding research of this developmental character had been of small scope, which then could be applied with some measure of assurance to the larger scale study.

Dr. Stouffer doubted that the question of the relative merits of small-scale and large-scale research was an important one. Both types are and should be used by large research organizations. Small studies are valuable for refining techniques and for securing leads, as well as for furnishing limited substantive data. Professor Stephan agreed and said that judgment was necessary in deciding when it is important to have intensive observation of a few individuals and when it is important to use broader statistical surveys. The advantages feed back and forth and each type of study is better for having the other.

In closing the meeting the Chairman stated that he would not undertake to summarize the discussion. The purpose of the session was not to secure a set of formal recommendations but rather to have the benefit of free discussion and exchange of ideas on the possibilities of a new study in fertility among people engaged in this and related fields. He expressed the hope, however, that the suggestion regarding the formation of a seminar or group to proceed with next steps might materialize. He was sure that the suggestions offered at the present meeting would constitute a stimulus for further re-

search in the field and that they would be of much help in shaping the preparations and plans for such research.[13]

[13] Addendum. A work session on preparation for new studies of fertility, attended by twenty-eight people, was held at Princeton University June 18–19, 1953, under the sponsorship of the Milbank Memorial Fund. Further preparations and plans for research in this field will be developed under a grant recently made for this purpose by The Population Council.

Appendix

Participants at the Round Table on Exploration of Possibilities for New Studies of Factors Affecting Size of Family

November 19–20, 1952

Twenty-ninth Annual Conference of the Milbank Memorial Fund

Chairman: Lowell J. Reed, *Vice President*
The Johns Hopkins University

Balfour, Marshall C., M.D., *Assistant Director, Division of Medicine and Public Health, The Rockefeller Foundation*

Bernard, Jessie, *Department of Sociology, The Pennsylvania State College*

Borgatta, Edgar F., *Lecturer and Research Associate, Laboratory of Social Relations, Harvard University*

Boudreau, Frank G., M.D., *Executive Director, Milbank Memorial Fund*

Brady, Dorothy S., *Consultant on Costs and Standards of Living, Bureau of Labor Statistics, Department of Labor*

Campbell, Angus, *Director, Survey Research Center, University of Michigan*

Cottrell, Leonard S., Jr., *Social Psychologist, Russell Sage Foundation*

Deutsch, Morton, *Assistant Professor of Psychology, Graduate School of Arts and Science, New York University*

DeVinney, Leland C., *Associate Director, Division of Social Sciences, The Rockefeller Foundation*

Dunn, Halbert L., M.D., *Chief, National Office of Vital Statistics*

Fisher, Burton R., *Professor of Sociology, University of Wisconsin*

Frederiksen, Norman, *Head, Research Department, Educational Testing Service*

Freedman, Ronald, *Department of Sociology, University of Michigan*

Herrera, Lee F., *Division of Biostatistics, New York University School of Medicine*

Hill, Reuben, *Research Professor in Family Life, Institute for Research in Social Science, University of North Carolina*

Kantner, John F., *Department of Sociology, College of William and Mary*

Kelly, E. Lowell, *Professor of Psychology, University of Michigan*

Kiser, Clyde V., *Milbank Memorial Fund*

Macmillan, Allister M., *Programme of Studies in Community Development, Cornell University*

Moore, Wilbert E., *Professor of Sociology, Princeton University*

Notestein, Frank W., *Director, Office of Population Research, Princeton University*

Osborn, Frederick, *President, American Eugenics Society*

Pratt, Lois V., *Bureau of Applied Social Research, Columbia University*

PRICE, DANIEL O., *Director, Social Science Statistical Laboratory, University of North Carolina*

REED, ROBERT B., *Department of Biostatistics, Harvard University School of Public Health*

SPENGLER, JOSEPH J., *Professor of Economics, Duke University*

STEPHAN, FREDERICK F., *Professor of Social Statistics, Department of Economics and Social Institutions, Princeton University*

STOLNITZ, GEORGE J., *Office of Population Research, Princeton University*

STOUFFER, SAMUEL A., *Director, Laboratory of Social Relations, Harvard University*

TAEUBER, CONRAD, *Assistant Director, Bureau of the Census, Department of Commerce*

THOMPSON, WARREN S., *Director, Scripps Foundation for Research in Population Problems, Miami University*

WARNER, WELLMAN J., *Head, Department of Sociology, Graduate School of Arts and Science, New York University*

WESTOFF, CHARLES F., *Milbank Memorial Fund*

WIEHL, DOROTHY G., *Milbank Memorial Fund*

WILLIAMS, ROBIN M., JR., *Director, Social Science Research Center, Cornell University*

ANNOTATIONS

THE POPULATION OF SWITZERLAND[1]

DESPITE its modest title the book covers a wide range of subjects. The main purpose of the author is to enhance the understanding of Swiss social institutions through an analysis of the structure and changes of Switzerland's population. This small country of some 4.5 millions inhabitants, shows an extraordinary diversity not only of scenery, but also of language, religion, customs, and social and economic structure. However, its people have learned in the course of centuries to blend their cultural differences into a national equilibrium. The author believes that such a population analysis provides at least a partial explanation of the paradox of stability and harmony in diversity.

The author who probably does not claim to be a demographer, bases his study largely on the statistical material provided and interpreted by other authors, especially W. Bickel in his BEVÖLKERUNGSGESCHICHTE UND BEVÖLKERUNGSPOLITIK DER SCHWEIZ (Büchergilde Gutenberg, Zürich, 1947). His merit is to have absorbed in an intelligent way the mass of material available and to have interpreted it against the historical, economic and social background. He also appears to have been greatly influenced by the book by J. Christopher Herold: THE SWISS WITHOUT HALOS (Columbia University Press). People are prone to look at the Swiss as a nation of peaceful milkers and farmers, imbued since ancient times with a spirit of friendliness, devotion, hospitality and generosity. J. C. Herold made an attempt to remove from their heads the halos, the shrine of which is kept fresh by an adroit tourist propaganda. The au-

[1] Mayer, Kurt B.: THE POPULATION OF SWITZERLAND. New York, Columbia University Press, 1952, xii + 336 pp., $5.00.

thor, who is himself a native of Switzerland, focusses his attention in a somewhat iconoclastic spirit on such remnants of the halos as may have escaped Herold's efforts.

Is Switzerland the "heart of Europe" or a "windowless antechamber"? Why is it that Switzerland is not a member of the United Nations whilst it welcomes United Nation offices on its territory? Is it a merciful haven or has it been engulfed in a "wave of narrow nationalism and xenophobia"? Is the country socially advanced and if so, how is it that it "is the last remaining Western country without women suffrage"?

Some of his developments may cause a shock to idealistic readers and may, at first sight, have little connection with a population analysis, but in fact they throw some light on population developments and population statistics. Thus the absence of reliable published records on refugees and on seasonal workers, their omission from population records, may simply reflect a mental attitude toward a problem.

Switzerland, a country without raw materials, has become, largely due to the merit of its honest and industrious population, one of the most industrialized countries of the world. Its national income per head of population is equally among the highest in the world. Its remarkable industry is, however, contrary to that of most other industrialized countries, largely decentralized, in many cases scattered over agricultural districts. By means of a thorough analysis the author helps the reader in avoiding pitfalls. It is difficult, in the case of Switzerland, to distinguish clear-cut geographical patterns, because most of the major socio-cultural factors cut across not only the political boundaries of the cantons, but across the geographical regions as well. Whereas the cantons with the highest nuptial fertility are mostly agricultural and Catholic, the industrial Protestant cantons have lower fertility rates. Vaud, an agricultural but Protestant French speaking canton has a low fertility rate and so has Geneva which likewise adheres to French culture. The author endorses Bickel's view that, whereas, as a rule, nuptial fertility in Switzerland depends primarily on the economic-occupational characteristics of the population, within an economically homogeneous population it is the religious affiliation which determines the fertility level, followed by the

linguistic factor. But what is the explanation of the low fertility of the canton Ticino, in spite of its agricultural character, its Catholic religion and Italian culture?

In a general way Switzerland has followed the demographic pattern of the Western countries with regard to mortality, fertility (general trend and differentials), industrialization, urbanization, trends in employment, etc. The author is, however, very well aware of the necessity of a minute differential analysis which, in the case of Switzerland, is needed possibly more than in many other countries.

The author states that as in other countries, industrialization has brought a growing concentration: the size of enterprises has tended to increase in industry, transport and commerce, there has been a decline of employers and independent workers as the result of both the flight from agriculture and the concentration process in the non-agricultural branches of the economy; the proportion of independents in the total labor force has likewise declined, while the proportion of the wage-earners has increased considerably. "Such fundamental changes in the social composition of the population go far to explain certain shifts in intellectual emphasis that have become increasingly noticeable in recent decades in all Western countries: it is only natural that the competitive spirit weakens when the number of opportunities for independent enterprise decline. The more a nation develops into a society of wage earners, the more does the desire for security tend to assert and manifest itself in its social institutions. . . . The decline of the 'old middle class' of farmers and independent business enterprises has thus been accompanied by a rapid rise of the 'new middle class' of salaried employees, a phenomenon of considerable social and political importance."

There is ample food for thought in these arguments which can be taken as applying to the whole Western world.

It would be easy to point out some flaws in the statistical material used, flaws which are due in part to the character of the Swiss statistics. Whereas much of the Swiss basic recording is among the best in the world, more detailed analytical data have not been readily available for past years or are not available at all for subjects such as religious affiliation (recorded in

Vital Statistics since 1940), data on age-specific death rates according to community size, on occupational mortality differentials, and on the average age at marriage. Moreover, considerable delay has occurred in tabulating the data concerning the "family size" as recorded for the first time in the 1941 census and births according to marriage duration, etc. The most conspicuous lacuna is possibly the absence of comprehensive migration statistics, "migration" being taken in a broad sense to include temporary immigrants, refugees, interned prisoners, etc.

Such statistical deficiencies as may be spotted here and there by an over-punctilious reader do not affect the general impression conveyed by this intellectually honest and stimulating book.

G. FRUMKIN

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CANCER ILLNESS AMONG RESIDENTS OF TEN METROPOLITAN AREAS[1]

EFFECTIVE control of a disease necessitates accurate, current, and representative information on the amount and nature of the particular disease in the population. The National Cancer Institute, with the cooperation of state and county

[1] Cutler, Sidney J.: Cancer Illness Among Residents in Atlanta, Georgia 1947. United States National Cancer Institute. Cancer Morbidity Series No. 1, 1050;

Cutler, Sidney J.: Cancer Illness Among Residents of Chicago, Illinois 1947. United States National Cancer Institute. Cancer Morbidity Series No. 6, 1952;

Cutler, Sidney J.: Cancer Illness Among Residents of Pittsburgh, Pennsylvania 1947. United States National Cancer Institute. Cancer Morbidity Series No. 5, 1951;

Cutler, Sidney J. and Marcus, Samuel C.: Cancer Illness Among Residents of Philadelphia, Pennsylvania 1948. United States National Cancer Institute. Cancer Morbidity Series No. 10, 1952;

Cutler, Sidney J. and Rowan, John C.: Cancer Illness Among Residents of Detroit, Michigan 1948. United States National Cancer Institute. Cancer Morbidity Series No. 9, 1952;

Grodowitz, William: Cancer Illness Among Residents of San Francisco and Alameda Counties, California 1947. United States National Cancer Institute. Cancer Morbidity Series No. 2, 1951;

Marcus, Samuel C.: Cancer Illness Among Residents of Birmingham, Alabama 1948. United States National Cancer Institute. Cancer Morbidity Series No. 8, 1952;

Marcus, Samuel C.: Cancer Illness Among Residents of Dallas, Texas 1948. United States National Cancer Institute. Cancer Morbidity Series No. 7, 1952;

Marcus, Samuel C.: Cancer Illness Among Residents of Denver, Colorado 1947. United States National Cancer Institute. Cancer Morbidity Series No. 4, 1951;

Warran, Irving I.: Cancer Illness Among Residents of New Orleans, Louisiana 1947. United States National Cancer Institute. Cancer Morbidity Series No. 3, 1951.

medical societies, undertook to provide such information on cancer by surveying the extent of illness from this disease in ten metropolitan areas for 1947 and 1948. Urban areas were chosen for the morbidity surveys because of the greater availability of good medical records for large numbers of cancer patients in these regions. The cities included in the study are Atlanta, New Orleans, Birmingham, Dallas, San Francisco, Denver, Chicago, Detroit, Pittsburgh, and Philadelphia.

Cancer morbidity surveys of the same ten areas were originally made during the period 1937–1939. With the publication of the current series, comparative morbidity statistics are now available for representative regions of the United States.

In each of the ten cities, reports were obtained on all cancer patients seen, diagnosed, treated, or under observation by physicians, hospitals and clinics during a twelve-month period. The surveys sought to answer such pertinent questions as: "How many people have cancer?"; "What parts of the body are most frequently attacked?"; "To what extent are age and race associated with cancer of specific sites?"; and "What are the chances of survival?"

Incidence, Prevalence and Mortality Rates. The prevalence and incidence rates for the ten cities in the first and second survey periods are shown in the table. Adjustment for the changing age composition of the population reveals that there has been an increase in both prevalence and incidence in all these areas with the exception of Chicago, where the rates remained at the same levels as in 1937. As the authors point out, it is difficult to assess the significance of these increases. How much of the increase in cancer illness rates was real and how much was due to improvements in case finding, diagnosis, therapy, and reporting cannot be ascertained. It is interesting to note that whereas incidence and prevalence rates increased from the first to the second survey periods in nine of the ten areas surveyed, the mortality rates remained at approximately the same level in five of the ten cities.

Age and Sex Differences in Cancer Incidence. Cancer is primarily a disease which occurs most frequently in late middle life and old age. Generally, cancer occurs at an earlier age among females than among males. Cancer incidence rates

are higher for females up to approximately ages 55–60, while in the later years of life the male rates are higher. This may be explained by the fact that cancers of the female genital organs and breast develop at younger ages than do the predominant forms of cancer found among males.

Despite the fact that cancer is closely associated with late adult life and old age, a large proportion of certain forms of malignancies occur in young persons. Leukemias, lymphomas,

Cancer prevalence and incidence rates per 100,000 population, among persons in ten metropolitan areas of the United States, 1937–1939 and 1947–1948.

Metropolitan Area	First Survey Period 1937–1939	Second Survey Period 1947–1948	Ratio of Second Survey Period to First Survey Period
	Prevalence per 100,000 population		
Birmingham	293	469	1.60
Atlanta[1]	313	340	1.09
Dallas	410	533	1.30
New Orleans[2]	432	480	1.11
San Francisco and Alameda Counties	365	470	1.29
Denver[1]	437	500	1.15
Chicago	346	341	0.99
Detroit	294	378	1.29
Philadelphia	399	434	1.09
Pittsburgh	331	384	1.16
	Incidence per 100,000 population		
Birmingham	202	345	1.71
Atlanta[1]	214	237	1.11
Dallas	314	372	1.18
New Orleans[2]	330	366	1.11
San Francisco and Alameda Counties	256	364	1.42
Denver[1]	295	371	1.26
Chicago	271	269	0.99
Detroit	195	267	1.37
Philadelphia	272	308	1.13
Pittsburgh	250	291	1.16

[1] The Atlanta and Denver rates were not adjusted for age.
[2] The New Orleans rates were adjusted for population growth.

cancers of the bone, brain and nervous system, endocrine glands (except the pancreas), and soft tissues were found to have a proportionately high occurrence among persons under 35 years of age.

Most of the newly diagnosed cases of cancer among males during 1947–1948, occurred in the following sites: skin, digestive system, genital organs, respiratory system, buccal cavity, and urinary organs. The primary sites among females with newly diagnosed cancer were: genital organs, digestive system, breast and skin.

Color Differences. Cancer illness rates are considerably lower for the nonwhite population than for the white. This was especially true among males. The most striking difference between the whites and nonwhites was the very low proportion of skin cancers among nonwhite persons. In Atlanta, skin cancer accounted for 1 per cent of all newly diagnosed cancers in nonwhite males during 1947, compared to 36 per cent in white males. For nonwhite and white females the percentages were 4 and 25, respectively. The lower rates, especially for nonwhite males, may be, in part, a reflection of less adequate medical care. It is probable that a large proportion of nonwhite males who have cancer, do not receive any medical care for that condition.

White males and females had higher cancer incidence rates for most sites of the body than did nonwhite males and females. The rate for cancer of the uterus, however, was higher among the nonwhite than the white females. Two factors which may account in part for this observed difference are number of pregnancies and inadequate medical care at termination of pregnancy.

Stage at Diagnosis, Site of Malignancy, and Survival. In each of the ten cities certain interrelationships are clearly illustrated. Early diagnosis of cancer is closely associated with accessibility of the tumor and also with length of survival. The earlier a case of cancer is discovered and the sooner that adequate treatment is initiated, the better are the chances for remission, survival, and cure. The stage at diagnosis varied with the primary site of the neoplasm. As may be expected, cancers of inaccessible organs generally went undiscovered until a late

stage. The most accessible sites, such as the buccal cavity and skin, had a greater percentage of early diagnoses than did such relatively inaccessible sites as the digestive and respiratory systems. However, the record for cancers of the accessible organs was far from satisfactory. Although the breast is considered an accessible site, in both Birmingham and Dallas only one-half of all newly diagnosed cases of this site were discovered in a localized state. In the other eight cities, the per cent of cases discovered while localized was even lower.

The variation in survival rates by stage of diagnosis is striking. In all of the ten cities those cancer cases which were diagnosed while the disease was localized had a better chance for longer survival than those discovered subsequent to regional or remote metastasis. This strongly suggests that improved diagnostic procedures which would make possible the discovery of more cases at an early stage of development, could result in a considerable saving in lives.

The lowest survival rates are found among patients with leukemia and cancers of the respiratory system (especially lung and bronchus), and digestive system. Best chances for survival were found among persons with cancer of the skin, breast and buccal cavity. It is apparent that both early diagnosis and survival are dependent upon the accessibility of the site of the malignancy.

The authors, by conducting careful investigations of cancer in representative groups of the population, have contributed much valuable data to cancer research and have provided the field of public health with more comprehensive cancer morbidity data than has been possible in the past.

KATHERINE SIMON

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ECONOMIC ANTHROPOLOGY[1]

THIS book is "a thorough revision" of the author's THE ECONOMIC LIFE OF PRIMITIVE PEOPLES which first appeared in 1940. The change made in the title represents a re-

[1] Herskovits, Melville J.: ECONOMIC ANTHROPOLOGY, New York, Alfred A. Knopf, 1952, 547, ix, xxiii pp., text edition, $5.75, trade edition, $7.50.

orientation in the author's point of view. The term "primitive" is rejected as a description of the societies studied, since it is both tendentious and devoid of precise meaning; it has been replaced in effect by a collection of descriptive terms such as nonliterate, non-industrial, and non-pecuniary. Of greater significance is the enrichment of the content of the new edition out of the post-1940 increment in the stock of information relating to the economic activities of non-industrial peoples. This increment is reflected in enlargements of the treatment of such subjects as labor, work-patterns, reward-systems, and consumption patterns.

The book is divided into six parts. The Introduction is devoted to consideration of the role of "rational behavior" in pre-machine societies and of the contribution that anthropology can make to the study of economic life. The section on Production deals with methods of getting a living, modes of work, specialization, and systems of pay and reward. Part III treats of gifts, ceremonial exchange, trade and barter, business enterprise, credit, capital formation, money and wealth, and consumption patterns. The section on Property deals with ownership, land tenure among various peoples, and the role of tangible and intangible goods. Part V, concerned with the use of "The Economic Surplus," treats of population growth, the cost of government, the service of the supernatural, the display of wealth, and the role of leisure. The last part is made up of certain of the author's conclusions. Professor Frank H. Knight's interesting review of the first edition, together with Professor Herskovits's reply, makes up an appendix. A number of tables and charts add appreciably to the usefulness of the book as do several maps of tribal and place names, a 15-page bibliography, and a reasonably good index. The book is nicely written and the format is pleasing.

This work "is an introduction to comparative economics, in the broadest sense of the term." It is intended primarily to provide information concerning the economic life of non-literate peoples and facilitate the economic analysis of this information. In consequence, the author encounters a problem (associated with the comparative method) which he has resolved perhaps as effectively as one can. If an author is dealing with

but one culture, its depth, the nature and degree of its integration, its potential sources of instability, etc., can be disclosed to the reader. If, on the contrary, an author (in the manner of Frazier or Sumner) lists seemingly relevant examples from many societies in conjunction with his discussion of particular topics, he is unable to supply adequate depth, etc. What amounts to a middle course is pursued by Professor Herskovits: he provides several or more examples but he attempts to avoid abstracting them too much from their cultural contexts.

In his concluding chapter the author, after having endeavored to specify carefully the degree of applicability of "economic determinaism" and "historical materialism", points to the very limited usefulness of such concepts as "individualism" and "collectivism" for the study of non-industrial societies. Few relationships fall into these polar categories. Even so, there remains a related question to which greater attention might have been given: As a society evolves out of the preindustrial stage into the industrial stage, does not the "economy" become more autonomous and more characterized by stability-preserving mechanisms? Professor Herskovits emphasizes the importance of distinguishing between technology and economic activity—a distinction frequently ignored until recently—and of making use of quantitative data. He calls attention to the uselessness of the concept of economic stages and to the importance of economist-anthropologist cooperation in the study of non-industrial societies.

The author does not treat in detail of the effects of the impact of contact with modern economies. He does, however, suggest that such impact produces an interplay between the cultures involved rather than a decidedly unilateral effect. And he aims to provide "a realization of the background against which" Euroamerican technology and industrialization "must be projected, if a workable adjustment is to be achieved." Indirectly also he brings home to the reader "a sense of the variation that marks the manner in which all men achieve those aims" which are sought through the "application of scarce means to given ends,"—a variation that is characteristic also of more industrialized societies.

Of great interest always to the economist and the demog-

rapher is the use to which a people puts that surplus of goods which it produces beyond its minimum requirements for life. For this surplus can be both a stimulator of the growth of output per inhabitant and a facilitator of other agencies such as technological improvements which may make for growth of output. As population and other data indicate, the capacity of non-industrial peoples to produce such a surplus varies greatly as does the surplus brought into being (for reasons that remain "obscure"). The surplus is utilized largely to support "social leisure," which means, since this surplus is quite unevenly divided, a leisure class considered superior by the underlying population. This class commands the surplus partly in virtue of its providing "government" and serving the "supernatural." The surplus is devoted largely to what Vablen called conspicuous consumption, a form of consumption that adds to the prestige of the leisure class. A problem confronting those who wish to convert a non-industrial into a modernized society is that of diverting the capacity to produce a surplus to the formation of income-producing wealth.

The resolution of this problem is not gone into by the author, nor is the resolution of many analogous problems suggested by discussion found elsewhere in the study under review. This omission, of course, is intentional. Nonetheless, in view of the great importance presently attached to the modernization of non-industrial societies, it would be worth while making the findings of this book bear more directly, in so far as this is possible, upon the selection of the approaches best suited to the modernization of these societies. J. J. SPENGLER

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POPULATION CHANGES IN EUROPE: 1939–1947[1]

FROM the point of view of demographic trends, few periods in Europe's history can have been as eventful, or confused, as the years from the outbreak of hostilities in 1939 through the initial period of readjustment following V-E Day. The continuing decline of civilian death rates and the unusual, still not

[1] Frumkin, Gregory: POPULATION CHANGES IN EUROPE SINCE 1939, with a preface by J. B. Condliffe. Augustus M. Kelley, New York, 1951. 191 pp. $3.75.

fully understood, behavior of birth rates that seems to have begun in the mid-thirties would have kept students of population busy in both empirical and theoretical pursuits even had there been no political or military developments of importance. When there were superimposed on these trends the manifold demographic effects of war, the situation became statistically almost unmanageable. Short-run changes in fertility patterns; wartime civilian and military deaths; mass movements of soldiers, prisoners of war, laborers, and displaced persons; and the disruption of record-keeping and census-taking procedures left much uncertainty about the size and development of Europe's population.

A great advance toward supplying the missing information has now been made by Gregory Frumkin, who was throughout its existence editor of the STATISTICAL YEAR-BOOK of the League of Nations. The core of Frumkin's book is a series of "balance sheets" detailing the sources of change in the population of individual countries from 1939 to 1945, and again from then until 1947. The territory covered includes all of Europe outside the present boundaries of the USSR with the exception of Albania, Turkey, Iceland, and a few very small areas. (In December, 1938, the population of the regions not covered by the study was less than 1 per cent of the total population of Europe outside the present Soviet Union.) Each "balance sheet," which is really more like a profit and loss statement in the usual terminology of accounting, contains the following items, or such of them as are applicable:

A. 1939–1945
- a) Population, end of 1938
- b) Population change resulting from territorial change
- c) Births
- d) "Normal" deaths
- e) War losses
  - i) Military
  - ii) Civilian, excluding Jews
  - iii) Jews killed
- f) Population shifts
  - f') Inward

i) Prisoners of war
ii) Other
f″) Outward
i) Prisoners of war
ii) Other
g) Population, end of 1945
h) *less* Displaced persons present
i) *plus* Prisoners of war outstanding
j) Population adjusted, end of 1945
B. 1945–1947
(The same items as above, except for war losses)

Such a "balance sheet" form has a number of advantages for the organization of this type of material. Comparison between countries, computation of figures for groups of nations, and discovery of gaps and inconsistencies in the data are facilitated. Wider general use of the technique than has heretofore been the case may be desirable, though it will be necessary to guard against the development of rigidity in patterns of thinking about demographic problems and against the temptation to make estimates to fill in empty lines on a balance sheet when no justifiable approximation is possible.

In Chapter I, "Population background," a brief history of European population movements in the last half century is given, chiefly through a series of graphs showing the course of the birth rate, death rate, and rate of natural increase for each country. The need for knowing the components of population change in addition to the number of people at census dates is pointed out, with special emphasis on the problem of assessing what past developments imply for the future.

Chapter II, "Method of approach: technicalities," presents the outline of the balance sheet form to be used, with comments on the various items. Although difficulties arose at all stages of the preparation of the balance sheets, "population shifts" proved to be the most serious problem, both the movement of prisoners of war and other forms of migration being sources of uncertainty. (P. 28.) Here, as in other parts of the work, it was often necessary to go beyond published or unpublished official data, consulting with authorities in the vari-

ous countries and often making somewhat arbitrary original estimates. Each item of the balance sheet was, in general, worked out independently without the use of any residual category that would make the net outcome check with the returns from postwar censuses. The reviewer agrees with Frumkin that the similarity between the results of the study and of the censuses is surprisingly good.

The bulk of the volume (130 pp.) is taken up with the individual reports for each country, the articles varying in length from less than a page for Malta to 23 pages on the difficult case of Germany. Each balance sheet is accompanied by a discussion of the particular problems involved in handling the data used. A list of main sources is given for each country and the text is cross-referenced to this list. Through the use of a simple system of symbols, indication is made of the degree to which the published figures represent adjustments of official statistics or original estimates of the author. Although the data available are too few to permit inclusion of the Soviet Union as part of the formal study, Chapter III includes a section summarizing such information as could be found relative to the population development of that country.

For the majority of readers the concluding chapter, "General results," will be of most immediate interest. Here the balance sheets for all the countries are brought together in convenient tabular form, arranged in five groups: Western belligerents (including Italy), Central belligerents (Germany and Austria), Eastern belligerents, Northern countries, and other countries (all the neutrals except Sweden). Combined balance sheets are presented for each group and for Europe as a whole. A useful summary discussion of the main features that emerge from the study points out that it is not so much the pattern for Europe as the differential development in the different regions that is of interest. Thus the Western, Northern, and neutral groups of countries each gained in population between 1939 and 1945, in spite of the war, while the Central and Eastern countries lost about 10 million persons, net, during the same period. (P. 175.) The distribution between civilians and the military of deaths due to the war, including genocide, also showed marked regional differences. Whereas in the Northern countries over

90 per cent of the war losses were military, in the Eastern group about 88 per cent of the war losses were civilian, almost equally divided between Jews and non-Jews. (P. 181.) A point at which Frumkin's analysis leaves him with a view divergent from that apparently held by many concerns the number of unrepatriated prisoners of war, which he concludes "can hardly be considerable." (P. 183.) The number of deaths due to the war is probably (correspondingly) larger than many have believed.

A book such as this whets the appetite for other, perhaps unobtainable, statistics. Having now an orderly study on a comparable basis of the total population of European countries, one would like to have the figures for age and sex groups, in particular for the population of working age. The author is of course aware of this and originally aimed his efforts at such a more detailed goal, but found it impossible to work out an age-sex series of balance sheets. Some small questions may be raised as to the presentation of the results. Thus, in spite of the difficulty that would be involved in setting forth completely the sources of data and the procedures used for estimation, somewhat more detailed documentation than even the considerable amount given would have been of much help to individuals employing the book either as a reference work or as a basis for further investigations of their own. Some of the comparative tables in the final chapter would be enhanced by the inclusion of percentage as well as absolute figures. The statement (p. 187) that "with the exception of the 'Axis' Powers, . . . the greatest toll in human lives was paid by the civilian population" appears to overlook the cases of the United Kingdom and the countries of the Northern group, where military war losses exceeded civilian. It is of course true that when the non-Axis countries are taken together, civilian losses predominate because of the great weight of numbers in the Eastern countries. These are minor matters, however, relative to the large accomplishment that this book represents. Everyone concerned with the development of Europe's population must be grateful to Frumkin for preparing the study (and to his publisher for making it available). Its place as a standard reference is assured.

GEORGE F. MAIR

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